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FACSIMILE OF THE
S K E T C H - B O O K
OF
W I L A R S D E H O N E C O R T,
AN ARCHITECT OF THE THIRTEENTH CENTURY.



FRANCIS PICKENS

FACSIMILE OF THE
S K E T C H - B O O K
OF
WILARS DE HONECORT,
AN ARCHITECT OF THE THIRTEENTH CENTURY;

ILLUSTRATED BY COMMENTARIES AND DESCRIPTIONS, AS ARRANGED WITH VARIOUS
ADDITIONS, AND PUBLISHED BY M. ALFRED DARCEL FROM THE MSS. OF

M. J. B. A. LASSUS,
LATE ARCHITECT OF NOTRE-DAME AND OF THE SAINTE CHAPELLE AT PARIS, &c.

TRANSLATED, EDITED, AND AUGMENTED WITH MANY NEW ARTICLES AND NOTES, AND
WITH THE REMARKS OF M. J. QUICHERAT, PROFESSOR OF ARCHEOLOGY
AT THE ECOLE DES CHARTES AT PARIS,

BY THE

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PREFACE.

THE manuscript which is the subject of the present volume is a most valuable monument of the state of the art of delineation in the thirteenth century. The actual works of painting, sculpture, and architecture which remain to us exhibit the finished results of those branches of the fine arts. This volume exemplifies the manner in which the artists carried on their studies. It proves that if they did not attain to perfection in representing corporeal forms, it was not for want of perceiving that they ought to be studied from the life, or from neglecting to carry out such studies. It also shews that they were not deterred by pious prejudices from copying the antique.

Wilars de Honecort has himself recorded that his lion was from nature,—many other of his animals were certainly so. Several of his human figures are evident academic studies from living models set in attitudes for the purpose: and their anatomical details are most carefully worked out, as well as the artist could manage them.

One page is occupied by an unmistakeable Greek, dressed in a chlamys; another by a drawing of a Roman sepulchral monument, with figures. In these examples the drapery was evidently the object of his admiration, for the human forms and the architecture are transformed into the styles that were familiar to him, after the manner of all the artists who attempted to delineate antiquity before the present century.

The architectural drawings are especially interesting for the light they throw upon mediæval practice. For example, Wilars de Honecort travels to Rheims, apparently to collect materials, by which to copy portions of it for his buildings of the choir of Cambray, and preserves for us the resulting drawings. I have shewn that in one instance at least, where he has drawn a part

of Rheims erroneously, the corresponding part of Cambray was erected as he drew it, and not as it stood at Rheims. I have also shewn that in his drawings of Rheims exactness in proportion and detail are neglected, and that, with few exceptions, he drew the buildings as he drew the antiques, not as they existed before his eyes, but in the fashion which they had assumed when his drawings were made, and to which his own practice had accustomed him.

The drawings are expressed by very few lines, all the minor details being omitted, but their absence is compensated for by sections of moldings. No dimensions are given, and the comparison of the drawings with the buildings they represent shews that the relative magnitudes of the parts to the whole are never preserved. But it must be remembered that the sketches were made for his own use, and not for the purpose of conveying to others the aspect of the buildings represented. Consequently, he only drew the combinations that struck his fancy as likely to be suggestive in his practice. He trusted to his own experience to supply dimensions when the occasion arose to make full-sized working drawings for the masons. He appears even to have altered parts of the buildings he was sketching, improving them as he thought, and giving them a more fashionable air as he went along, to save himself the trouble of doing so when he wished to engraft them upon one of his own designs.

It is evident that the methods of drawing which this Sketch-book has preserved to us are wholly insufficient to convey any ideas of the exact proportions or artistic character of an edifice. But we see that in those days there could have been none of the mechanical copying which is the reproach and misfortune of our own, because there was no sufficient power of delineation to enable a travelling architect to transfer a building or a detail to his sketch-book so completely as to admit of its being reproduced when its effect upon his eyes had been forgotten. He might have caught inspiration from the sight of great works in his passage, but unless he possessed a genius of the same order as that which had originated them, he would have been wholly

unable to give to his imitations their beauty and spirit, and in any case, must have supplied so many details of his own to enable the building to be erected, that it would necessarily acquire an individual character.

Our artist has in general furnished us with no means of determining whether his compositions and sketches are original or copies. Many of them are certainly drawn by himself from the life or reality. His geometrical method of portraiture must not be considered as his own invention, but merely as a collection of examples to place the system on record for the use of his successors. Neither can his series of geometrical devices relating to masonry and construction claim to represent the ordinary practice of his period, for a regularly educated architect would not make notes of matters familiar to himself and his fellow-workmen. From the nature of these problems it is manifest that the whole is merely a chance collection of expedients to meet particular cases, or of novel methods which struck him in the course of his travels, and which he noted for his own use. The same may be said of the machines, which, however, are for the most part extremely curious, and shew the antiquity of many contrivances now familiar to us.

The facsimile plates which are contained in this volume were engraved at Paris in 1851, under the direction of M. Lassus. The collection of materials for their illustration and the preparation of the commentary employed so much time, that upon his lamented death on the 15th of July, 1857, the work was left incomplete. His manuscripts were, however, placed by his family in the hands of M. Darcel, and were by him prepared for publication, and finally issued from the press in the autumn of the last year. The text of the present volume differs in many respects from that of the French edition, although based upon it in the same manner as that was based upon the original and admirable commentary published in 1849 by M. Jules Quicherat, the Professor of Archæology at the Ecole des Chartes. To that essay I owe my first knowledge of the existence of the manuscript. In 1851, I eagerly sought the original in the Bibliothèque Impériale, and obtained the rare privilege of

tracing those of its pages which interested me as belonging to architecture and mechanism.

Having thus obtained the materials for studying at leisure the interpretation of these selected portions, I was induced to postpone the publication of the results I had arrived at, by the prospect of a speedy appearance of the whole from the able hands of the eminent and highly qualified editor who, as I found, had undertaken the work. But as his labours have been unhappily cut short and left imperfect, I have ventured to add to them my own, and to attempt the formation of a commentary that should include the opinions of the writers who have as yet interested themselves in the question.

Much matter at the beginning of the French edition relating to a controversy between the classical and mediæval styles in Paris has been omitted, as foreign to the illustration of our artist. In justice to M. Quicherat, I have substituted a translation of his spirited and ingenious essay for the *Notice sur Villard de Honnecourt* with which the French editor has prefaced the commentary. I have supplied a description of the manuscript itself, with classified tables of the subjects of the drawings and their peculiar arrangement, which I trust will facilitate an acquaintance with its varied contents.

In accordance with the French edition, each plate is furnished with its own explanation. Those which relate to the drawings of figures and animals are literally translated from the admirable articles of M. Lassus, with a few slight abridgments. But the discussions of the architectural plates, and those which relate to geometry and mechanics, have either received large additions, or are entirely new. In the former case, each portion has been distinguished by the initial of the writer to whom it belongs^a, placed at the end of it; such initial being understood to include all the matter above it which extends either to the beginning of the article or to some previous initial. The foot-notes are

^a These initials are: (Q.), Quicherat; (L.), Lassus; (A.D.), Alfred Darcel; (W.), Willis. In the descriptions of the first six plates, which happen to apply wholly to figures and animals, and are entirely derived from the French, this notation was accidentally omitted. In other cases where the initials have been left out, the use of the first person in the text will at once shew that it is written by the present editor. —(W.)

marked in the same manner. When the article has been written anew, the opinions of previous commentators worked into it have been carefully distinguished by name.

I cannot better close this Preface than by a concise glance at the labours of the amiable and highly cultivated artist with whose name mine has been in this volume associated. J. B. A. Lassus, born at Paris on the 19th of March, 1807, became, in 1828, a student of the *Ecole des Beaux Arts* at Paris, at a period when the contest between the classical and mediæval architects had been fostered by the publication of Victor Hugo's celebrated novel, the *Notre-Dame de Paris*. Lassus became a devoted mediævalist. His first architectural work was the restoration of the refectory of St. Martin des Champs at Paris, to fit it for the library of the *Conservatoire des Arts et Métiers*. It was followed by the restoration of St. Severin in 1837, St. Germain l'Auxerrois in 1838, and others, including that of the *Sainte Chapelle*, which was in 1849 left completely in his hands. Besides these restorations, which were the means of forming a school of sculptors, glass-painters, smiths, decorators, and workers in wood, Lassus erected many mediæval buildings from his own designs, of which the first was St. Nicholas at Nantes in 1843, followed by the construction in 1848 of a nave to the Cathedral of Moulins, of which only a choir had previously existed, and of many others. He wrote much, constantly struggling in defence of his favourite style against the partisans of classical antiquity, and maintained his place in the first rank of his profession. In 1850 his merits received the distinction, so highly valued by his countrymen, of the cross of the Legion of Honour. But in the midst of his prosperity and success an insidious malady was working within, and finally removed him from his earthly labours in 1857, leaving a blank in his profession that will not easily be filled up.

R. WILLIS.

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These woodcuts are the same as those of the French edition, with the exception of those marked with an asterisk, which have been engraved by Mr. Jewitt for the present edition, in additional illustration of Honecort's text. The blocks of the two views of the apsidal chapel of Rheims Cathedral (figs. 31 and 34), were obligingly lent to the publisher by the editors of M. Viollet-le-Duc's Dictionary of Architecture.

ESSAY
ON
WILARS DE HONECORT AND HIS SKETCH-BOOK,
BY M. JULES QUICHERAT.

(Extracted from the Revue Archéologique for 1849, t. vi. p. 65.)

THE uncertainty which prevails with respect to the practical methods employed by the mediæval artists, and our absolute ignorance of the manner in which they were taught and trained, must create an interest in the description of a manuscript, unique of its kind, which is apparently the sketch-book of an architect of the thirteenth century.

This singular work, which we shall term an Album, is contained in the collection of manuscripts from the Abbey of St. Germain des Prés deposited in the Imperial Library at Paris, (S. G. Latin, 1,104). It is a small volume of thirty-three leaves of vellum stitched into a thick rough leather cover^a, which wraps over the front edge of the leaves. A memorandum written in the fifteenth century on the last page records that the book then contained forty-one leaves, but the mutilations by which their number has been reduced to thirty-three are apparently of considerable age. The leaves are not all cut to the same size, their dimensions varying from 6 to 6½ inches in breadth, and from 9 to 9½ in height. Each of them is occupied with pen and ink drawings that have been previously sketched with a lead point, and many of the drawings are accompanied by explanatory notes written in the Picard dialect of the thirteenth century, and in the running-hand of that period.

This manuscript was known to Willemin, who selected from it a sufficient number of figures to compose a plate of costumes for his *Monuments Français Inédits*^b, and M. Pottier accordingly examined it, and concisely described it in the

^a A more detailed account of the volume is given in the following chapter.

^b Willemin's *Monuments Français Inédits*, published at Paris in 1839, was commenced in 1806. The descriptive text was written by Pottier. In pl. 102, vol. i., Willemin engraved several subjects from

the manuscript of De Honecort, and to this plate the following description is supplied:—"Le volume qui a fourni ces costumes, dessinés au simple trait, est un recueil extrêmement singulier et digne de tout l'intérêt des artistes, c'est *l'Album* le calepin d'un artiste du xiii^e. siècle, qui a déposé sur ses pages toutes les

explanatory text of that work. It was subsequently shewn to several experienced antiquaries, who carefully studied it, but reserved their opinions, possibly from the difficulty they found in discovering a satisfactory interpretation of the whole of its contents. The writer of these remarks has no such ambitious pretensions, for who can be expected to explain every part of a miscellaneous collection, embracing every branch of construction and decoration. The purpose of this essay is simply to follow up the discovery of Willemin and Pottier by making a stronger appeal to the attention of the learned, in the form of such a detailed description of the contents of this precious volume as may induce them to study and discuss it, to publish it more completely, or at least to extract from it all the valuable information that can be obtained for the advance of archæological science.

We will now endeavour to draw out, by comparing together the explanatory notes already mentioned with the subjects of the drawings, some particulars relating to the author of the manuscript, the period at which he lived, and his works.

On the second page (pl. 2) we read, "Wilars de Honecort salutes you, and implores all who labour at the different kinds of work contained in this book to pray for his soul, and hold him in remembrance. For in this book may be found good help to the knowledge of the great powers of masonry, and of devices in carpentry. It also shews the power of the art of delineation, the outlines being regulated and taught in accordance with geometry."

This may pass for the author's preface. It tells us his name, his birth-place, and the nature and purpose of his book. Wilars de Honecort having compiled this collection, bequeaths it to future artists in the same pursuits, requiring but their grateful remembrance and their prayers.

Wilars, to judge by his surname, was a Cambraian, for Honnecourt is a village on the Scheldt, five leagues south of Cambray. This conjecture acquires more

fantaisies de son imagination toutes les acquisitions de son savoir. On y trouve des sujets pieux, des scènes domestiques, des modèles d'architecture, des problèmes de géométrie. Voici au reste, sinon le titre, au moins le préambule exact dont l'auteur a fait précéder son ouvrage." Here follows the entire legend of the second page, including the "Ci poies vos trover les agies (miracles?) des xij. Apostles en seant," which the writer has hastily confounded with Honecort's real preface that follows it. Pottier next gives a description of the subjects selected in the plate, observing that "Le style des draperies étudié, fouillé, et tourmenté comme dans certaines

figures du xvi^e. siècle, est vraiment extraordinaire pour l'époque, si tant est qu'il n'ait pas été rajourni par le graveur." The last remark is enough to prove that M. Pottier had not taken the trouble to examine the original manuscript at all, but described the figures from the engravings of Willemin. The descriptive note of the contents of the manuscript above quoted was probably written by Willemin himself at the time when the tracings were made for his engraving. The figures selected by Willemin are the two foliage faces of pl. 9, the group in pl. 26, and the warrior mounting his horse in pl. 45.—(W.)

certainly from the subjects of two of his drawings, the one a plan of the Church of Vaucelles, an abbey close to Honnecourt, the other a plan of the choir of the Cathedral of Cambrai.

Like most of the men of his time who pretended to knowledge or cultivation, our architect had travelled. "I have been in many lands," he writes^c; adding, "as this book shews." Effectually, the book is an itinerary: his steps may be traced in it through France from north to east, and across the German empire to its extreme limits. Stopping at Laon, he sketches one of the towers of its cathedral, "the most beautiful that the world contains^d." His careful studies of the architecture of the Cathedral of Rheims shew that he remained there a long time. His passage by Meaux is attested by a plan of St. Stephen, and his visit to Chartres by a drawing of the great western rose-window of the cathedral. In the next place we find him before the west front of Lausanne Cathedral, making a hurried sketch of the rose-window there. Lastly, his Album bears evidence of a long residence in Hungary.

It is to be regretted that the manuscript of Wilars de Honnecourt contains so little information concerning his own architectural works. In fact, there is but one composition distinctly claimed as his own, and he even shares the merit of that with a fellow-workman^e. It is simply a plan for the presbytery of a church of the largest class. The choir is circumscribed by a double aisle, with nine chapels radiating outwards, and alternately square and semicircular in plan^f. "Vlardus de Hunecourt and Petrus de Corbeia contrived this presbiterium in a discussion together." There is no evidence to shew that it was ever actually erected.

For lack of direct proofs by which to place our Cambraian artist amongst the great masters of construction of the thirteenth century, we must have recourse to induction.

One of the allusions to his journey to Hungary is made upon occasion of a sketch which he took at Rheims:—"When I drew this I was under orders to go to Hungary^g." Why under orders, unless commissioned to work as an artist in his profession? His reputation must have been so thoroughly established as to have extended to the confines of Europe; and as it is improbable that an architect would have been fetched from a distance of four hundred leagues for a trifling

^c Pl. 17.

^d Ibid.

^e The care with which he explains that this is his own work seems to shew that the other drawings are

not his inventions, but merely copies.—(W.)

^f Pl. 28. Corbie is a village in Picardy, near Amiens.

^g Pl. 19.

work, we can only suppose that Wilars de Honecort journeyed to Buda or Strigonium to erect some magnificent church.

It has been already stated that one of the drawings in the Album^b is a plan of the ancient Cathedral of Cambrai. Under this is a note to the effect that it represents the plan of the eastern part, or "chevet," of that church, "as it is now rising from the ground. Farther on in this book will be found the interior and exterior elevations, the arrangement of the chapels and side walls, and the form of the flying buttresses." But instead of these promised drawings, we find at the end of the book a setⁱ representing the analogous parts of the Cathedral of Rheims most carefully drawn. Above one of those which represent the chapels is written, "This shews the elevations of the chapels of the Church of Rheims—like them will be those of Cambrai if they be built."

It appears, therefore, that when this was written the east end of Cambrai Cathedral was actually commenced but unfinished, and that the reference to the elevations of Cambrai written under the plan was merely a reference to those of Rheims which were to be taken as the model of the former.

But, as we find our architect thus identifying in his mind these two buildings, declaring beforehand, and with the air of a master, the form which it was intended to give to the unfinished parts of Cambrai, and at the same time studying and copying most minutely the portions of Rheims which were required to complete them, how can we escape the inference that Wilars de Honecort was the architect of the Cathedral of Cambrai.

It may be said, that supposing this to be true we have only proved him to be a plagiarist, instead of a man of originality and ability. But there may have been other reasons to make a similarity between these two churches imperative upon the architect. Cambrai was not the metropolitan church, but was dependent upon the archiepiscopal Church of Rheims. Archæology shews that this kind of ecclesiastical relation between churches was often expressed architecturally by similarity of plan or style. The partial reproduction of the Church of Rheims at Cambrai may be the result of this principle, and not of a defect of originality in the architect.

But if it were a copy, the sanctuary of Cambrai must have had an aspect of peculiar magnificence. For there was an old saying in the North, that to make a perfect church you must unite the choir of Cambrai, the nave of Arras, the transept of Valenciennes, and the steeple of Antwerp. The traditions of the country

^b Pl. 27.

ⁱ Pls. 59, 60, &c.

lament its loss, for it was destroyed at the Revolution. But in 1824, when its site was levelled, the architect of the city, M. Aimé Boileux, was enabled to make a complete plan, which was engraved in M. Leglay's history of the Cathedral^k. This plan coincides exactly with that given in our manuscript.

If the above reasoning be thought to have led us rather to probabilities than to certain information respecting the practice of Wilars de Honecort as an architect, the facts appealed to will at least enable us to determine with mathematical precision the age of the manuscript, and thus the period of the author; for we have only to extract from the histories of the two buildings of Cambrai and Rheims the dates of the respective portions already alluded to.

The Cathedral of Cambrai was originally Romanesque throughout, but its eastern portions were reconstructed on an enlarged plan in the thirteenth century. The transepts were in building in 1227; the new choir was commenced at the back of the existing one, by the foundation of the first or western chapel to the north of the sanctuary in 1230, followed by the second chapel to the south in 1239, the central chapel in 1241, and the second chapel on the north in 1243; the date of the first chapel on the south is not recorded, but was probably between 1230 and 1239. Thus the radiating chapels which circumscribed the new apse of Cambrai were built between 1230 and 1243. Finally, the completion of the choir itself is recorded by the fact that at Easter, 1251, the clergy took formal possession of it.

Now the note attached to the plan of Cambrai in the manuscript shews that the buildings were commenced, but so little advanced as to make their completion somewhat problematical,—“The chapels will be like these *if they be ever finished* :” and not only were the chapels unfinished, but also the flying buttresses essential to the choir, for the form of which our author refers to those of Rheims. Hence the plan in the manuscript must have been drawn during the suspension of works between 1243 and 1251.

The known dates of the works at Rheims are in perfect accordance with this conclusion. The east end, commenced in 1211 by Robert de Couci, was finished as far as the transepts when he died in 1241. The apse, or “chevet,” with its circuit of chapels, was certainly finished in 1215^l. As for the nave, of which Wilars has also given drawings, it was built between 1241 and 1257; and as the drawing only embraces a single bay, it follows that if only one compartment were

^k Vide plate 67.

^l M. Quicherat notes that the choir was consecrated October 18, 1215, according to Marlot; but

this is an oversight, for that author discredits the tradition which is the sole foundation for the date in question.—(W.)

completed before 1251, our chronological inference, that the manuscript was written between 1243 and 1251, will hold good. But it may be possible to fix the date of the manuscript within narrower limits, and to ascertain with precision that of the principal fact in the biography of Wilars de Honecort.

The sketch (in plate 19) which, as he tells us, he made at Rheims when he was on the start for Hungary, represents a window of the side aisles of the nave, and is therefore, as well as his journey, posterior to 1241.

Hungarian history shews that in 1242 the Tartars invaded the Danubian provinces, and drove out nearly the entire Hungarian population, who returned the next year and expelled their conquerors, but found all their towns in ruins. The city of Strigonium (now called Gran), the capital and ornament of the empire, was rased to the ground. Bela, the reigning king of the Hungarians at that epoch, applied all his resources to the restoration of that great city. He sought to restore it to its splendour, its animation, and its European character, for at the time of the invasion it was almost exclusively peopled by French and Italians. Amongst other works he constructed for the Friars Minors a sumptuous church to the Virgin, in which he had chosen his burial-place. In ignorance of the exact date of the construction of this great church, we cannot ascertain whether Wilars de Honecort was concerned with it, but it is impossible not to see a connection between his journey and the works undertaken to repair the ravages of the invading Tartars. We may suppose that he started for Hungary in 1244, after the complete deliverance of the country. By his own account he remained there a considerable time; "I was there for many a day" (*maints jours*^m), an expression that may comprehend two or three years.

Supposing him to have returned to France towards 1247, he may have written the memoranda in his sketch-book before the recommencement of the works at Cambay, which were completed in 1251. Probably he was then in declining years, and preparing to retire from the world, and therefore set about completing his manuscript for the use of posterity.

Our author's journey to Hungary suggests some other instructive remarks. First, King Bela was the brother of Elizabeth of Hungary, a princess so devoted to our Lady of Cambay that her offerings served to pay for the work of reconstruction of the transepts of that church, commenced in 1227 under the presumed direction of Wilars de Honecort. Secondly, Elizabeth of Hungary died in 1231, was canonized, and became the object of peculiar devotion at Marburg,

^m Pl. 29.

where she was buried. There, under her invocation, was built in 1235 a magnificent church; and this church has semicircular transepts, an uncommon arrangementⁿ, but which happens to occur also at the Cathedral of Cambray. Thirdly, the south apsidal chapel of the latter cathedral, built in 1239, and, as we have supposed, under the direction of Wilars de Honecort, was dedicated to this very saint, Elizabeth of Hungary.

The dates which we have derived in this essay have shewn that Wilars de Honecort belonged to the great school of art of the period of Philip Augustus^o. They place him in the midst of that generation of remarkable men by whose labours the Gothic style and system of construction was brought to its highest perfection. This fact invests with an incalculable interest the book we are about to examine, containing, as it does, so much information with respect to the manual processes and methods of construction employed at the time it was composed.

Thus far we have literally followed the able and ingenious essay of M. Quicherat, to most of whose conclusions M. Lassus declares his entire adhesion. The latter anxiously sought for information respecting the architecture of Hungary, in hopes of discovering traces of Wilars de Honecort; for this purpose he entered into a correspondence with Doctor Emeric Henszlmán, a native of Cassovia, or Kaschau. This antiquary published the results of his researches on the influence of French architects of the middle ages in Hungary in a Parisian journal^p, from which the French editor of the present volume (M. Darcel) has extracted the facts and plans that follow, assisted by the rough notes and letters that M. Lassus had left amongst his papers.

It appears that at Gran, the ancient Strigonium, every mediæval building has been replaced by more modern edifices, so that no researches can be made there, and that amongst the few Hungarian monuments of architecture in which French influence can be detected, the most striking is the church dedicated to St. Elizabeth at Cassovia, or Kaschau.

The plan of this church is very similar in the disposition of the chapels

ⁿ This is a very common arrangement in Germany, and probably travelled from thence to Cambray, which is thus simply an instance of German influence upon the neighbouring districts.—(W.)

^o Philip the Second of France, who reigned from 1179 to 1223.

^p Namely, the *Moniteur des Architectes*. Paris, March, 1857.

to that of St. Stephen of Meaux, and more especially so to that of St. Yved at Braine, near Soissons, as the subjoined plans shew very clearly. The want of elevations, by which alone the real styles of these churches and their actual construction can be compared, makes it impossible to decide whether or no they belong to the same school of architects. But we will now follow the descriptions in the French edition as far as they go. In the two churches at Cassovia and at Braine there are the same shallow lateral chapels, the same central chapel composed of two severeys terminated by a five-sided apse, or semi-decagon, and the same column placed in the axis of each lateral chapel to receive the middle vault rib. In both plans the opposite columns which belong to the most eastern of the lateral chapels are placed in continuation of the rank of piers that separate the nave and side aisles. But the relative position of the other two chapel columns to the great tower-piers are quite different^a.

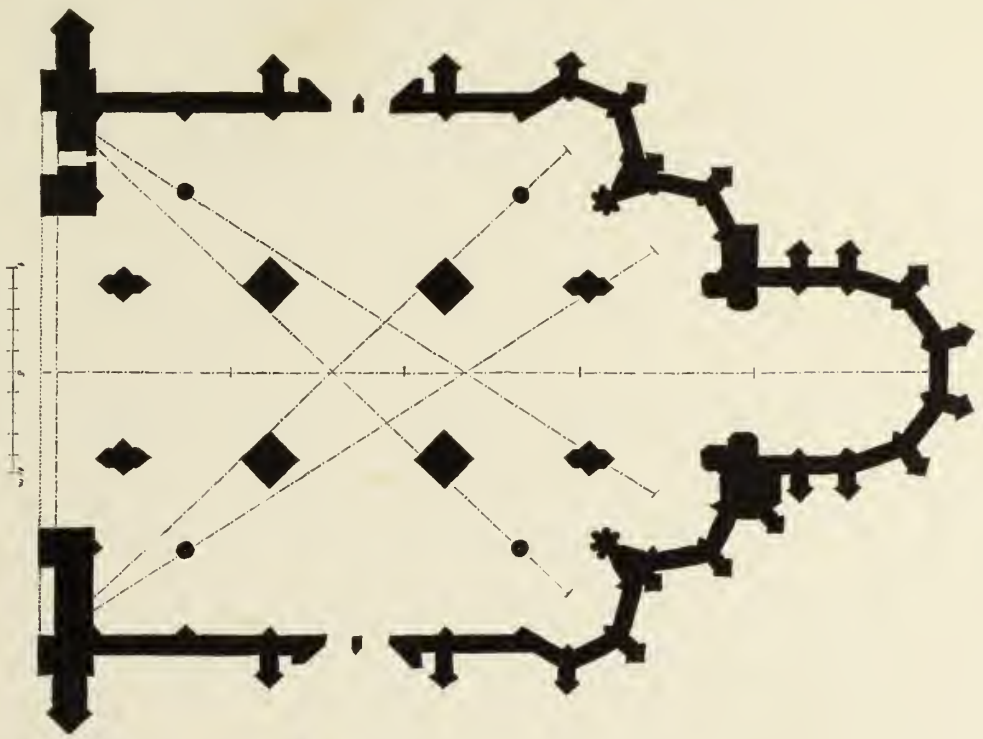
Also the lateral chapels at Braine^r are semicircular, but those of Cassovia are polygonal, and the arrangement of the other portions of the plans are altogether dissimilar. In fact, the latter church was built in the fourteenth century, consequently long after the journey of Wilars de Honecort. It stands, however, upon the foundations of a church of the thirteenth century, the crypt of which still exists under the first apsidal chapel on the north side. Two documents in the archives of Cassovia mention the existence of a church of St. Elizabeth in 1263 and 1292, which, according to the conjecture of Dr. Henszlman, may have been built by Stephen, her nephew, who resided in that city in 1260, and afterwards came to the throne of Hungary as Stephen V. in 1270. Unfinished or ruined in consequence of the departure of Stephen to the seat of royalty, the church was subsequently carried forwards to completion between 1330 and 1380, by Elizabeth, the queen of Charles Robert, upon the ancient foundations, the plan of which is, as it has been shewn, essentially French; but the disposition, and probably the number, of the piers was modified. Moreover, in this subsequent completion the German system of three aisles of equal height was adopted.

M. Henszlman quotes other Hungarian churches which retain evidences of the French system; for example, at Szekesfchervar, Veszptem, H. Marton, and

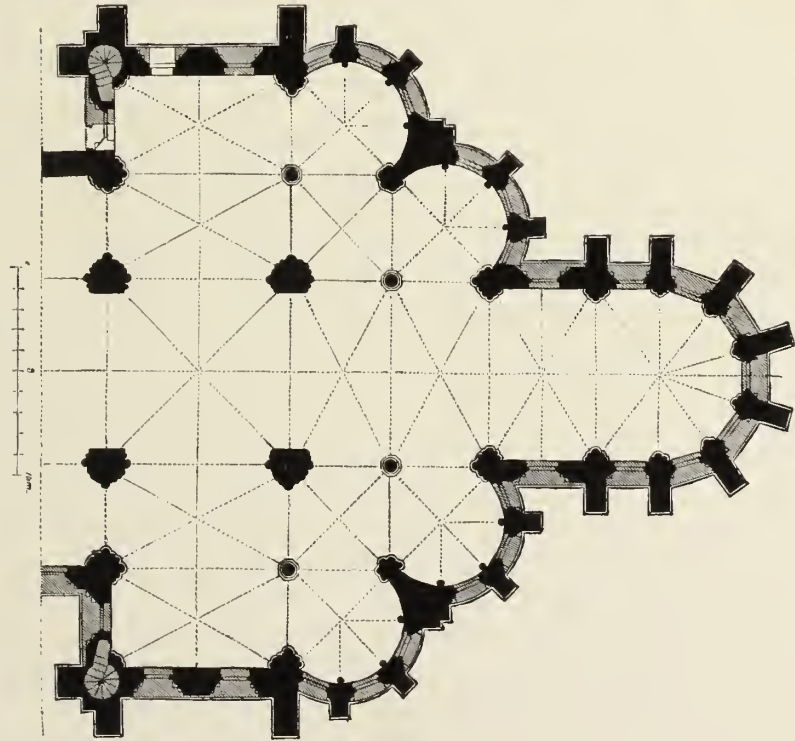
^a The plan of the Hungarian church indicates a peculiar system of vaulting symmetrically disposed about the central tower that cannot be thoroughly understood without elevations or perspective views.—(W.)

^r Without attempting to assume Wilars to have been the architect of St. Yved at Braine, it may easily be granted that he, as a Picard, being acquainted with this church, would naturally imitate it at Cassovia.—(W.)

ST. ELIZABETH AT CASSOVA.



ST. VEED AT BRAINE.



Leyden. Lassus, or his editor, concludes that the journey of Wilars de Honcourt to Hungary was made after the apse and transepts of Cambay were finished, and that he may have begun St. Elizabeth at Cassovia about 1250, and have assisted in the construction of the church of St. Elizabeth at Marburg and in the restorations at Strigonium; agreeing with M. Quicherat in the supposition that he obtained this employment by having constructed the church at Cambay, the favourite object of the devotions of St. Elizabeth.

DESCRIPTION OF THE MANUSCRIPT AND ITS CONTENTS^a.

THE general nature and dimensions of the manuscript have been described in the previous chapter, but there are many particulars relating to it which require a more minute examination.

It is composed of inferior vellum, and, as Mr. Burges well describes it, resembles "a large pocket-book, and is bound in pig-skin, now become about the same colour as a very much used saddle. The leaves are fixed to the cover by threads going right through the back, and encircling very stout bands of leather on the outside: these bands are thus real and constructive^b." The cover wraps over the front edge of the leaves, and they are arranged in six quires.

The sheets of vellum of which the book is composed are either folded in the middle, so that each forms two leaves, or merely doubled over at the back edge, so as to form but one leaf and a narrow slip or guard. The whole are stitched into six quires, which contain different numbers of leaves.

Thus the first quire has seven leaves, in three sheets and one half-sheet.

The second quire has seven leaves, and is made up of two whole sheets and three halves.

The third quire has but three leaves, namely, one whole and one half-sheet.

The fourth quire has six leaves, or two whole sheets and two halves.

The fifth quire has eight leaves, in three whole and two halves, and the last quire is merely a single whole sheet.

This is by no means the original extent of the manuscript, which has been reduced to this condition by the abstraction of more than a third of its leaves. The slips of the half-sheets for the most part shew by the state of their edges that the leaf which originally completed them has been cut out, and some of them retain portions of the writing or drawing which occupied the missing piece. In some of the quires a double slip bears testimony to the former existence of a whole sheet of which both leaves have been removed. It is possible that other sheets or leaves may have been so withdrawn as to leave no trace behind. This kind of

^a I have substituted this chapter for the short notice given in this place, headed "Album de Villard de Honnecourt," in the French edition.—(W.)

^b Builder, Nov. 13, 1858, p. 758.

evidence is corroborated by allusions in the legends that accompany the drawings to others that are not now to be found, and also by the ancient pagings of the volume, by which the loss of leaves can be detected.

The drawings are, with one exception, made on both sides the leaf; and there are four systems of paging, which have been applied to the book at different periods. The first is an alphabetical set, which is written on both sides of the leaf, but extends only to the letter r. This belongs to the thirteenth century, and must have been made soon after the manuscript was composed.

The second system belongs to the fifteenth century, and extends from one end of the volume to the other, but is only applied to the right side of the pages. It begins with the letters of the alphabet, and proceeds with tolerable regularity till it reaches the letters t and u. But the writer, at this point, having discovered that the alphabet would not carry him to the end of the volume, has assumed the letter v to be the numeral v, and has continued the paging with Roman numerals to xxvii. which completes the book. The characters have been written by an unskilful scribe, and are much blotted, the pages having been turned before the ink was dry, so that for the most part each character leaves a trace on the opposite page, and some of them are so blurred as to be illegible.

The third system is a modern paging in Arabic numerals, written on the right side of the leaf only, and therefore inconvenient for reference; because, as the drawings are on both sides, the terms *recto* and *verso* must be employed to distinguish them. In all the references of the present volume the fourth system has been employed, which is the one used in numbering the plates of the facsimile. These plates are arranged in the same order as the pages of the manuscript, and consequently their numbers correspond to a complete set of paging numbers applied in the usual manner to each side of the leaf^c.

The traces of abstracted leaves that have been just described shew that the manuscript was originally stitched together in the following order.

The first quire had four sheets, the second had six, the third had three, the fourth had four, the fifth had five, and the sixth had five, making a total of twenty-seven sheets, or fifty-four leaves, supposing that no leaves have been abstracted excepting those of which traces or slips remain, or of which the loss can be proved by the interrupted paging.

Now for the missing leaves, it appears that the first quire has lost the fourth

^c The only exception is, that the third leaf having its *recto* blank, no number applies to it. In the plates, the characters which form the ancient pagings are carefully represented with their blurs and blots,

even to the traces occasioned by the setting off of the opposite marks. The modern Arabic paging of the manuscript is not inserted.

leaf; the second quire, the second, fifth, sixth, seventh and tenth leaves; the third quire, the first, fifth and sixth leaves; the fourth quire, the first and second leaves; the fifth quire, the second and eighth leaves; and finally, the sixth has lost the whole of the four inner sheets. The total loss of leaves is therefore twenty-one, and the number of leaves that remain, as already mentioned, is thirty-three. Some of the leaves may have been cancelled by Wilars himself.

At the end of the volume there is written, in fifteenth-century characters,—“En ce livre a quarante et 1 feuillet. J. Mancel.” The proprietor of the book was therefore J. Mancel, and it had then forty-one leaves. It was apparently this Mancel who wrote the paging which has been already stated to be in characters of his period; and we learn by comparing his memorandum with the account already given of the number of leaves, that the book had lost thirteen leaves when he had it, and that eight have disappeared since.

Mancel's paging shews that one of the latter was the missing second of the fifth quire, which he had numbered xi., and that the other seven were all taken from the sixth quire, of which the only two remaining leaves are numbered xix. and xxvij. Supposing, therefore, that this quire was originally of five complete sheets, one of the leaves must have been removed before the book came into the possession of Mancel.

The characters employed by the paging scribe of the fifteenth century after he adopted the Roman numerals are very distinct, but those which he wrote in the previous part of the volume are often ambiguous and obscure; their peculiarities are pointed out in the descriptions of the plates as they occur.

With respect to the manner in which the drawings are executed, Mr. Burges, who has minutely examined the originals with the eye of a practised artist, states that the object was first drawn with some substance resembling the black lead of the present day; in all probability a lead or silver point, or even the common black stone used by the masons. The circles, drawn in pencil with compasses, were inked in by hand, and this was the case even with the straight lines. “The ink, by the strangest coincidence, exactly resembles the indelible brown of the present day, and like it where it has been used thickly, becomes a very dark rich brown; where, on the contrary, employed more sparingly, it presents a light yellowish brown^d.”

^d Vide Mr. Burges, in the *Builder*, Nov. 13, 1858, p. 758. M. Quicherat states that the drawings were sketched with black-lead, “esquissés à la mine de plomb.” M. Lassus, or his editor, that black stone was employed: “Les dessins sont, pour la plupart,

d'abord tracés à la pierre noire.” They were then passed over with a pen and ink, but the black stone was sometimes used to shade the depths and folds of the draperies.—(French edition, p. 57.)

The subjects that are chosen for the drawings may be classed under figures, architecture, with masonry, carpentry, and practical geometry, and machines.

The first occupies the greatest space; for of the sixty-three plates that remain, thirty-five are wholly devoted to it, and six shared with the others, making a total of thirty-eight plates, and leaving only twenty-five for the remaining subjects; in other words, figures take up about three-fifths of the whole. Many of them are drawn on a scale that occupies the whole page, and they are either single or in groups, and represent sacred personages, symbolical and moral figures, studies from the antique or from nature and ordinary life, elementary figures for learners, and animals of all kinds. The persons or events to which they refer are very rarely indicated by inscriptions, and must be left to conjecture. Architecture, which occupies a space equivalent to about sixteen plates, gives to us plans of churches and other buildings, mostly drawn from real ones, perspective views, if they may be so called, of the tower of Laon and the chapels of Rheims Cathedral, drawings of windows, of a clock-house, lectern, stall-work, &c., and elevations and details of one compartment of Rheims Cathedral. Three plates are exclusively devoted to masonry and practical geometry, about two to carpentry, and three, with the halves of two others, to machines.

At first sight it would seem as if the subjects were mixed up in this volume without method or classification, but this is not altogether true, neither is it possible that the want of order which they exhibit is the effect of a re-binding or a rearrangement of the volume; for it will be observed that the same subject continues over several pages, and that generally when another subject is taken up, the page, or at least the leaf, at that point is shared between the two. Thus figures occupy the first seven plates, then come two plates of machines and architecture, a leaf with figures on one side and architecture on the other, a leaf with architecture on one side and architecture and figures on the other, two pages with figures, one with figures and machines, two of architecture, one architecture and figures, seven of figures, one of figures and architecture, two of architecture, and so on, as the annexed table shews. If the subjects at the two ends of the same sheet be compared, the same kind of evidence of the original mixture of dissimilar objects will be obtained. Rigid classification plainly never entered into the plan of the artist, but he went on drawing figures until he was tired, and then began drawing architecture, and so on; or, more probably, at first assigned a few blank pages at the beginning of his book to figures, and the next few to architecture; and thus, when the former were filled with figures, he was compelled to continue his figures on the pages beyond his architecture, and thus the subjects became arranged in alternate groups in a manner which happens to every

writer of a commonplace book. That the sketches were made at separate times, and probably from real objects, or copied from paintings or sculptures that he encountered in his travels, is shewn by the fact that several of them are inverted, by the accident of opening the book with the wrong end upwards, which so frequently occurs in sketching. It is also evident that he, as space ran short, sometimes inserted a sketch in a spare corner of a back page that had been nearly filled up already. His intention of observing as much method as the circumstances admitted of, is shewn by four contiguous pages devoted exclusively and completely to his *elements of portraiture*, and followed by three others similarly appropriated to the *geometry of masonry*, as he himself declares.

On the whole, I conclude that the volume is a veritable sketch-book, and the drawings inserted in it from time to time, and that it is not a collection made up or rearranged in after-life by its possessor. The inscriptions, on the contrary, from the manner in which they are written between and amongst the drawings, and the dark colour of their ink, shew plainly that they are subsequent additions for the information of posterity, and not contemplated at the time the drawings were made, for no space had been reserved for them.

One at least of the drawings was made upon the vellum before the sheets were bound up, for the lances of the cavaliers in plate 15, which is part of the outside sheet of the second quire, are continued across the present fold, and shew their points above the heads of the figures in plate 26. This only proves that when the book was bound this sheet of vellum was introduced into it upon which the drawing had already been made.

The plates of this volume form a complete facsimile of the original manuscript, and therefore preserve its unclassified arrangement. Nevertheless, it is absolutely necessary that the detailed description or explanation of each plate should accompany it, for the attempt to describe the subjects of the plates in a methodical series would lead to so much troublesome reference from one plate to the other, as to nullify the advantages of such a systematic mode of proceeding. It is true that in the admirable essay of M. Quicherat, of which the first part has been already presented to our readers, this method is employed, and with great success. But that essay is illustrated only by a few copies of the leading drawings selected from the collection, and printed in wood on the pages where their descriptions occur.

Two tables are subjoined, which will enable the arrangement of the volume and the nature of its contents to be understood, and the various specimens of each subject compared together at pleasure.

The first table gives a comparative view of the different systems of paging that have

been applied to the manuscript, the arrangement of the sheets in quires, and the distribution of the subjects. It is disposed in the form of four parallel columns. The first contains the modern paging of the MS., which is confined to the right side of its leaves; the asterisks denote the places of the leaves that have been abstracted, and the brackets which connect the figures and asterisks in pairs shew that each pair belong to the same sheet, and thus explain the arrangement of the quires^e; the second column contains the ancient paging, the third the numbers applied to the plates of this edition, which correspond to a system of paging on both sides of each leaf; the last column shews the distribution of the subjects under the general heads of Figures (F), Architecture (A), Machines, Carpentry, &c.

The second table is a classified list of all the several drawings in the manuscript arranged under these general heads, with references to the plates that respectively contain them.

^e In the French edition some discrepancies occur between the account of the distribution of the quires at page 56, and the notes which are appended to the descriptions of the plates; I have pointed these out

as they occur in the latter descriptions. My own table is the result of my own notes, made from an examination of the manuscript in 1851, and collated with the descriptions in the French edition.—(W.)

DESCRIPTION OF THE MANUSCRIPT

Modern Paging and Original Arrangement of Quires.	Ancient Paging. 13th centy. 15th centy.	Paging of Plates.	Subjects.	Modern Paging and Original Arrangement of Quires.	Ancient Paging.	Paging of Plates.	Subjects.		
FIRST QUIRE.	a. . . .	1	} Figures.	FOURTH QUIRE.	s.	34	} Art of Portraiture.		
	b. . . .	2				35			
	c. . . b.	3				36			
	d. . . .	4				37			
	f. . . .	5				38			
	i. . . d.	6	39			} Masonry and Geometry.			
	k. . . .	7	40						
	l. . . c.	8	41			F.			
	m. . . .	9	42			F.			
	. . . f.	10	43			Machines.			
	o. . . .	11	44			Mach ^s . & Carp ^s .			
	p. . . g.	12	45			F.			
	q. . . .	13							
SECOND QUIRE.	r. . . h.	14	F.	FIFTH QUIRE.	x.	46	} F.		
		15	F.			47			
	. . . i.	16	F. and Machines.			(xi.)		48	
		17	A.			xii.		49	
	. . . k.	18	A.			xiii.		50	
		19	A. and F.					51	
						xiv.		52	
								53	
						xv.		54	
	. . . l.	20	} F.					55	
		21						xvi.	56
	. . . m.	22							57
		23							
. . . n.	24		xvii.	58					
	25			59					
. . . o.	26		xviii.	60					
	27	F. and A.		61					
THIRD QUIRE.	. . . p.	28	A.	SIXTH QUIRE.	xix.	62	A.		
		29	A.			63	A.		
	. . . q.	30	A. and F.			(xx.)			
		31	F.			(xxi.)			
	. . . r.	32	F. and A.			(xxii.)			
		33	Carpentry.			(xxiii.)			
						(xxiv.)			
			(xxv.)						
			(xxvi.)						
			xxvii.	64					
				Recipes.					

CLASSIFIED LIST OF THE SUBJECTS OF THE DRAWINGS.

SACRED OR EMBLEMATICAL FIGURES.

	PL.
FIGURES.—Christ teaching, seated on a throne	31
Christ seated, in the attitude of benediction	20
Christ standing, also in the act of benediction	53
Christ prostrate (in Gethsemane, or on the road to Calvary?)	32
Sleeping figure (an apostle in Gethsemane?)	45
The Flagellation and the return to Pilate	55
A crucifix	4
A monumental cross, or rood, with the Virgin and St. John	14
The Descent from the Cross	25
Virgin and Child	34 & 19
The Twelve Apostles, with three other figures	2
Two standing personages (apostles?)	54
Large head (a study for an apostle?)	34
One of the damsels before Solomon	22
A prophet? standing	49
Small seated figure	30
Group of six (the Magi before Herod? or Paul before Agrippa?)	24
Symbolical figure of the Church	7
Martyrdom of SS. Cosmos and Damian	52
Small seated figure of a bishop	1
Pride and Humility	5
The wheel of Fortune	41

SECULAR FIGURES.

Two seated figures—Young man and lady (copied by Willemin)	26
Warrior mounting his horse (copied by Willemin)	45
Warrior standing	3
Two cavaliers	15
Two foot-soldiers	49
Large, seated personage	48
Two gamblers	16
Two wrestlers	27
Two other groups of wrestlers	36
Two male figures, studied from nature	42
Three male figures: one seated, and drawing a sword; another standing, mitred; and a third standing, crowned	23

	PL.
Female with parroquet and dog	50
Viol-player with dancing-dog	50
A thresher	34
A mower and two trumpeters	36
Knight on horseback	36
Head of a mendicant	17
Various heads and faces	35, 37
Tomb of a Saracen (Pagan), from the antique?	10
Antique figure of Mercury?	57
Male figure standing at an altar (from the antique?)	21
The Art of Portraiture occupies plates 34, 35, 36, and 37.	

ANIMALS.

Winged Lion of St. Mark, and Bull of St. Luke	25
The taming of the lion	46
Combats with lions	51, 52
Lion, viewed in front	47
Lions, 36; horses (with riders), 5, 15, 36, 45; horse's head, 35; stag, 34; sheep, 35; greyhound, 35; dogs, 13, 46, 50; cat, 13; boar, 16; boar's head, 36; hare, 16; bear, 6; porcupine, 47; dragon, 20; demon, 1.	
Eagle, 35; swan, 6; owl, 1; magpie, 1; parroquets, 50; pelican, 1; ostriches, 35; fishes, 37; crawfish, 13; grasshopper, dragon-fly, and horse-fly, 13; snail, 3.	

Flowers, 36; foliage and foliage ornament, 9; two foliage heads, 9; two others, 42; initial letter S, 11.

ARCHITECTURE AND CONSTRUCTION.

PLANS.

	PL.	No.
A square-ended church for the Cistercians	27	
The east end or presbitery of a church projected by De Honecort and Peter de Corbie	28	
Ditto of Vaucelles	32	
Ditto of Cambray	27	
Ditto of a church at Meaux	28	
A square chamber, vaulted, with a central pillar	40	33
An apse with twelve windows	38	5
The tower of Laon Cathedral	17	

DRAWINGS.

View of the tower of Laon Cathedral	18
Interior of one of the apsidal chapels of Rheims Cathedral	59
Exterior of the same	60

CLASSIFIED LIST OF THE DRAWINGS.

19

	PL.	NO.
Elevations, exterior and interior, of one severcy of the nave of Rheims Cathedral	61	
Details and sections of mouldings for the above	62	
Flying-buttresses of Rheims Cathedral	63	
A window of the nave of the same	19	
Rosc-window at Chartres	29	
Rose-window at Lausanne	30	
A gate-house	35	
A clock-house	11	
A lectern	12	
Poupée and stall partition	53	
Large poupée for a stall	56	
Small tabernacle	17	
Symbolical city	6	
Tile pavements	37, 29	
Labyrinth of Chartres Cathedral	13	

PRACTICAL GEOMETRY.

To measure the diameter of a nook-shaft	39	21
To find the diameter of a column of which only half is visible	38	1
To find the centre of a circle from three points of its circumference	33	2
To adjust a square	39	22
To draw a spiral	39	25
To cut the mold of a great arch in a small space	38	3
To lay out a square cloister	38	11
To set the four corner-stones of a cloister	38	14
To trace the plan of a pentagonal tower	40	35
To divide a square slab into two equal squares	38	15
To make two vessels, the one twice as capacious as the other	38	17
To measure the breadth of a stream without crossing it	38	12
To measure the width of a distant opening	38	13
To measure the height of a tower	39	32
The proportions of a spire	39	28, 29
To cause a pear to fall upon an egg	40	34
To set up two pillars at the same height	39	31
To bring two stones to the same point	38	7
To describe three kinds of arches with one opening of the compasses	40	40
To shape the key-stone of an arch of the third point, and also of the fifth point	39	23, 24

MASONRY.

An oblique voussoir	38	9
A window in circular masonry	38	8
An arch with the centering outwards	38	4
The voussoirs of hanging arches	39	30

	PL.	NO.
A cusped voussoir	40	39
To cut the springing-stones of a vault or arch	38	6
To form the springing-stones of a vault	40	38
To cut the voussoirs of vaulting surfaces	39	20
To find the centre of a given voussoir	40	36
To trace the joints of voussoirs	38	18
To cut the joints of voussoirs by scales	39	27
To draw the extrados of a given voussoir	40	37
The bond of a square pier	39	26
The bond of a pier at Rheims	29, 62	

CARPENTRY.

Roof for a vaulted chapel	33	
Boarded waggon-roof	33	
Roof for a side aisle	33	
Floor with short timbers	44	
Wooden bridge with short timbers	38	10
Framing to restore a falling house	44	

MACHINES.

Saw-mill	43	
Saw to cut off pile-heads	44	
Screw to raise weights	43	
Trebuchet	58	
Heliotropic angel	43	
Eagle-desk	43	
Hand-warmer with gimbals	16	
Tantalus cup	16	
Perpetual motion	8	
Method of cutting a screw	38	16
Framing of a wheel	44	
Hammer wheel	37	
Crossbow, with sight	43	
Esconsa, or dark lantern	33	

RECEIPTS.

Hydraulic cement	41
Depilatory paste	41
A potion to cure wounds	64
How to preserve flowers	64

2

J. G. Lat. 1104



M. Germoni a. Bratis



N. 1104.

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EXPLANATION OF THE PLATES.

PLATE I.

MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *a*.

THIS page is marked with the red stamp which in the days of the Revolution authenticated the seizure of the volume, as national property, from the library of the Abbey of Saint Germain des Prés. The stamp, in red ink, bears in its centre the two letters R F, as initials of the words *République Française*, and is surrounded by the inscription BIBLIOTHÈQUE NATIONALE.

The words "Sancti Germani a Pratis, N. 1104," in the middle of the page, shews where this volume came from and its distinctive number, whilst the memorandum "S. G. Lat. 1104," placed at the top of the page, shews that it is in the present day ranked in the St. Germain Latin collection, in which it bears that number.

The page is occupied by a figure of a bishop, and some drawings of animals, which were probably designed for a "Bestiary," as books of natural history were termed in the middle ages. In the first place, we find a pelican perched on its nest with wings outspread, in the act of tearing its breast to feed its young. In the Bestiaries the pelicans are said to be extremely fond of their young, but that when the latter begin to grow up, they rebel, and attack the old ones, who become enraged and kill them. On the third day after this, the mother (or father) returns, and tearing open its breast with its bill, the blood is shed upon them and restores them to life. For they receive the blood and drink it^a. The pelican is thus assumed as an emblem of the Saviour, and therefore represented during the middle ages in medallions enamelled or engraven at the extremities of crosses.

The bishop, in pontifical costume, is sitting, giving a blessing in the Latin manner with his right hand, and holding his episcopal crosier in his left: he wears a low mitre, is clothed in an alb with tight sleeves, a tunic and chasuble with the border of the amice shewing round the throat, leaving the upper part of the alb exposed; the maniple has been omitted. This figure, which, from the numerous

^a Vide an admirable Essay on the Bestiaries, in the *Mélanges d'Archéologie* of Cahier and Martin, vol. ii. p. 136.

folds, seems to have been a specimen of German art, was probably a sketch from a painted window rather than from a piece of sculpture.

An owl, the *nycticorax*, is the reverse of Christ, and represents the Devil, the friend of darkness. In Bestiarics the owl is generally represented surrounded by day-birds, who are disturbed by his presence, and in a woodcut published by the Rev. P. Cahier, in his Essay on the Bestiarics^b, already quoted, we find among these day-birds that threaten the impassive owl with their beaks, a magpie, drawn very much like the one in our plate. It might be inferred that this magpie, holding something cruciform in its beak, and leaning towards a monster apparently watching it, is a distant recollection of the fable of the fox and the crow, but this cross is a subsequent addition, as well as the tablet (somewhat resembling a tombstone) on which the bird now appears perched, and against which the monster seems to lean. There appears originally to have been no connexion between these figures. The monster is perhaps the "Centicore," an imaginary animal which is thus described in M. Cahier's Essay, already quoted, (t. iii. p. 223): A beast from the deserts of India, in colour black, and very fierce, with two horns on his head, perfectly straight, and as sharp as a sword. When he fights with another beast, he lays one horn along his back, and only uses the other. His snout is round, he has the thighs of a lion, the feet and body of a horse, and the tail of an elephant. By using only one horn at a time he is said to symbolize mankind, who never put forth their whole force in combating the devil. As to the inscription on the tablet, the ink is so faded that it is impossible to decipher it: but enough can be traced to shew that it was in French, and must have been either a draught or a copy of an epitaph, but without any connexion with Wilars de Honcourt. The date M.CCCC.LII^{xx}.IIII. juiex (July, 1483), that accompanies the lozenge-shaped escutcheon, is, moreover, in the writing that belongs to the close of the fifteenth century.

^b See also, for the explanation of the symbolism of animals, the *Bestiaire de Guillaume, clerc de Normandie*, published by M. Ch. Hippeau.

Si poeul uos trouer les aguel del .xij. apostles
en seant.

¶ Si lars de honneort u' s'abe z si prore a tos ceus qui de cel engiens
ouuertont . con trouera en cest liure q' l' prorent por l'arnie
z qui loz souzengne de vi. Car en cest liure puet o' trouer grant
consel de le grant force demaconerie z del engiens de carpenterie.
z si trouerel le force de le por ^{trantuse} . tel tras en si come liars
de rometrie le quād z ensaigne .

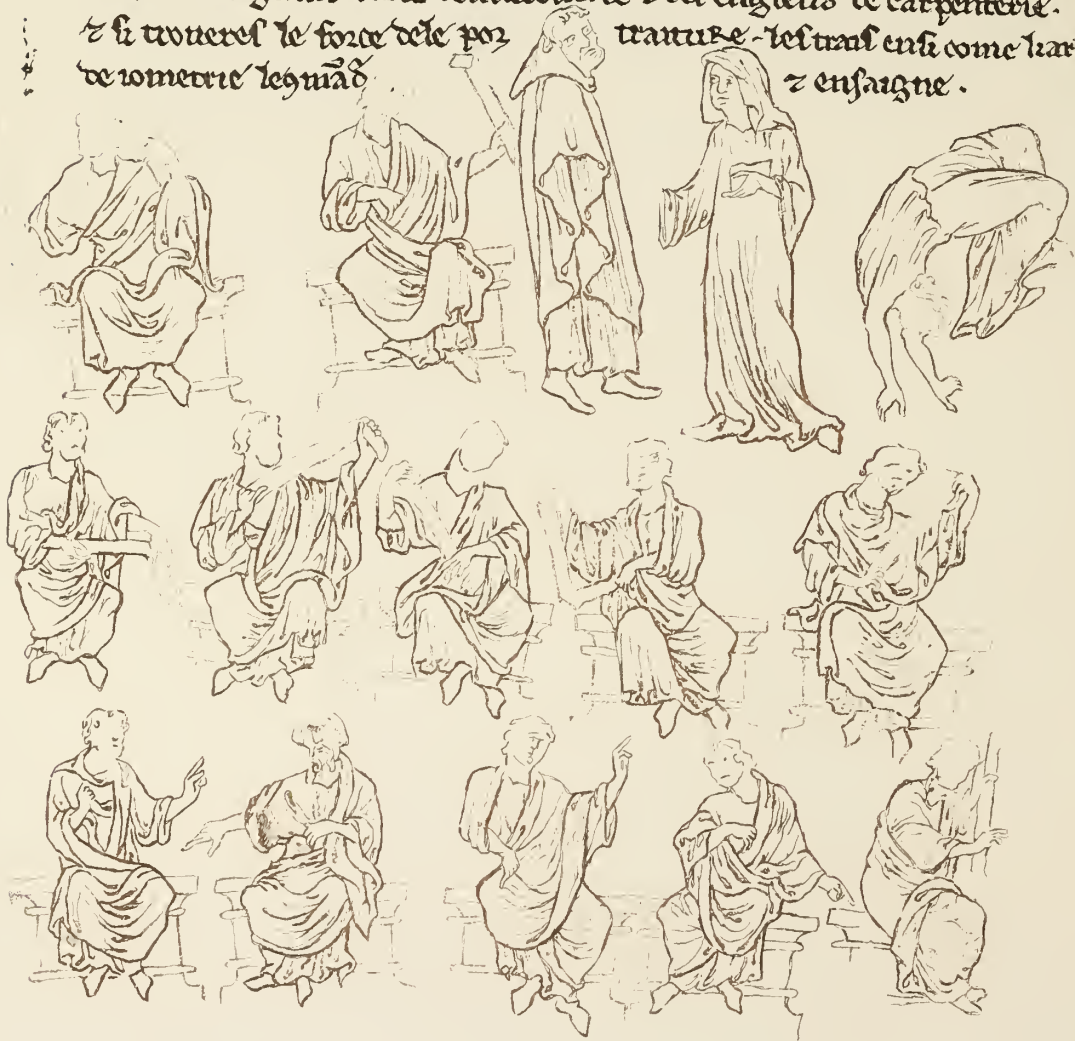


PLATE II.

MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *û*.

“Ci poies vos trover les agies^e des xij. apostles en seant.

“Wilars de Honnecoort vous salve, et si proie à tos ceus qui de ees engiens ouverront eon trovera en eest livre quil proient por s'arme et quil lor soviengne de lui. Car en eest livre puet on trover grand conseil de le grant force de maconerie et des engiens de charpenterie, et si trovez le force de le portraiture, les traits ensi come li ars de iometrie le command et ensaigne.’”

“Iei vous pouvez trouver la figure des douze apôtres assis.

“Villard de Honnecoort vous salve, et prie tous ceux qui travaillent aux divers genres d'ouvrages contenus en ce livre de prier pour son âme, et de se souvenir de lui; car dans ce livre on peut trouver grand secours pour s'instruire sur les principes de la maçonnerie et des constructions en charpente. Vous y trouverez aussi la méthode de la portraiture et du trait, ainsi que la géométrie le commande et l'enseigne^d.”

“You find here the images of the twelve apostles seated.

“Wilars de Honnecoort salutes you, and implores all who labour at the different kinds of work contained in this book to pray for his soul, and hold him in remembrance. For in this book may be found good help to the knowledge of the great powers of masonry, and of devices in carpentry. It also shews the power of the art of delineation, the outlines being regulated and taught in accordance with geometry.”

This inscription, the author's preface, from which we learn his name, his birth-place, and the nature and object of his work, has been fully explained and discussed in the introductory chapter^e. It only remains to consider the images, which were evidently drawn before the inscription was written, from the manner in which the lower lines interfere with the heads of the figures. It will be remarked that there are, besides the twelve, three others not alluded to by De Honnecoort. The twelve apostles are seated, holding labels, and seeming to converse in groups of two or more. They remind us of those of the north-east doorway of the Cathedral of Bamberg. There the apostles are seated six and six, above the capitals of the columns in the jambs of the doorway, and hold one and

^e M. Merimée is of opinion that the proper translation of *agie* is the costume or attire of the apostles. (Building News, vol. iv. p. 1280.)—(W.)

^d The interpretations of the Picard inscriptions into modern French in this English edition are those

which are given by the French editors, unless otherwise mentioned; but I have occasionally endeavoured to keep closer to the original in the English translation of these inscriptions.—(W.)

^e See p. 2, above.

the same label, on which the "Credo" composed by them was intended to be inscribed. On the lintel of the west door of Chartres the apostles are also seated, conversing, two and two, and mostly holding books.

The three other figures in the first row are dressed in the civil costume of the thirteenth century, while the apostles wear a robe and mantle draped in the antique fashion. The man wears a cowl over his robe; the woman, holding a book in her hand, is dressed in a full robe without a girdle, and with loose sleeves, and has a veil over her head and neck. Behind her is a dancing-girl, perhaps the daughter of Herodias, as in the tympanum of the north-west door of the Cathedral of Rouen; she is dancing on her hands.

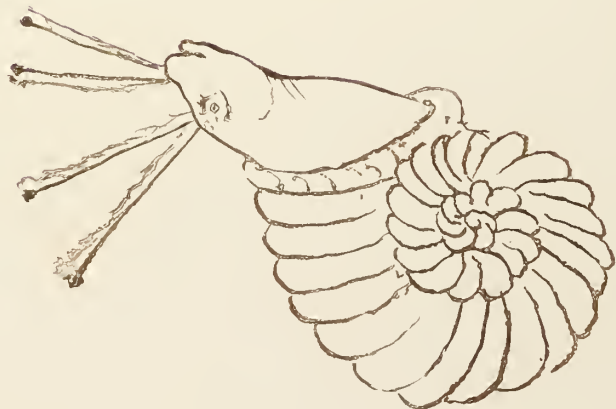
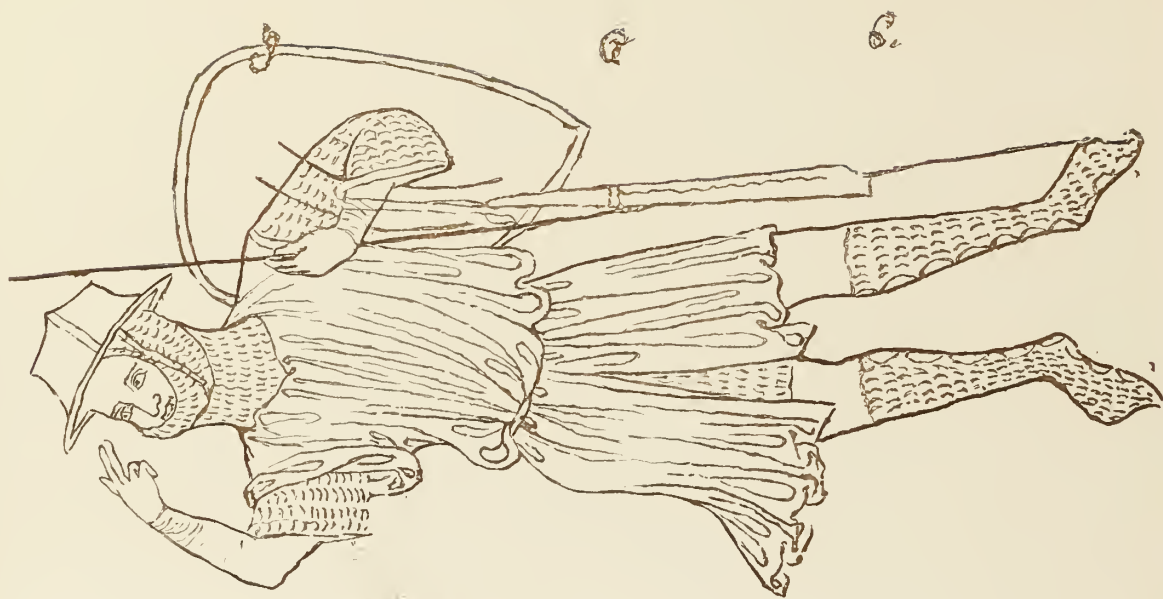


PLATE III.

RECTO OF THE SECOND LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *c*, IN THE FIFTEENTH WITH THE LETTER *b*.

A SNAIL coming out of his shell, his head armed with four horns.

A beardless warrior clothed in the mailed and hooded hauberk, with short sleeves; it reaches to just above the knees, without it being possible to see whether it terminates like breeches or like a kilt. He wears an iron hat over the mailed hood, and a surcoat drawn in at the waist, open in front below the girdle, and with very short sleeves covering the hauberk, and which is put on over a tunic, the tight sleeves of which alone are visible. Mailed greaves are laced on the leg below the knee, which is left bare, and are continued downwards so as to cover the foot. The knee appears to be entirely uncovered, perhaps because it was protected when on horseback by the saddle-bows, which sometimes projected considerably. This warrior carries his shield^f on his left arm, from which a club is also suspended by a looped strap, and he holds the staff of his lance in his hand; he points with two fingers of his right hand to his forehead. Is this Goliath? At all events, it is not "de Honnecort, such as he appeared in Hungary^g," despite the inscription traced near him, for this inscription is an addition of the fifteenth century.

^f This shield, making allowance for the perspective distortion, appears to be of the heater form, with the upper angles rounded.

^g "de Honnecort cil qui fut en Hongrie."

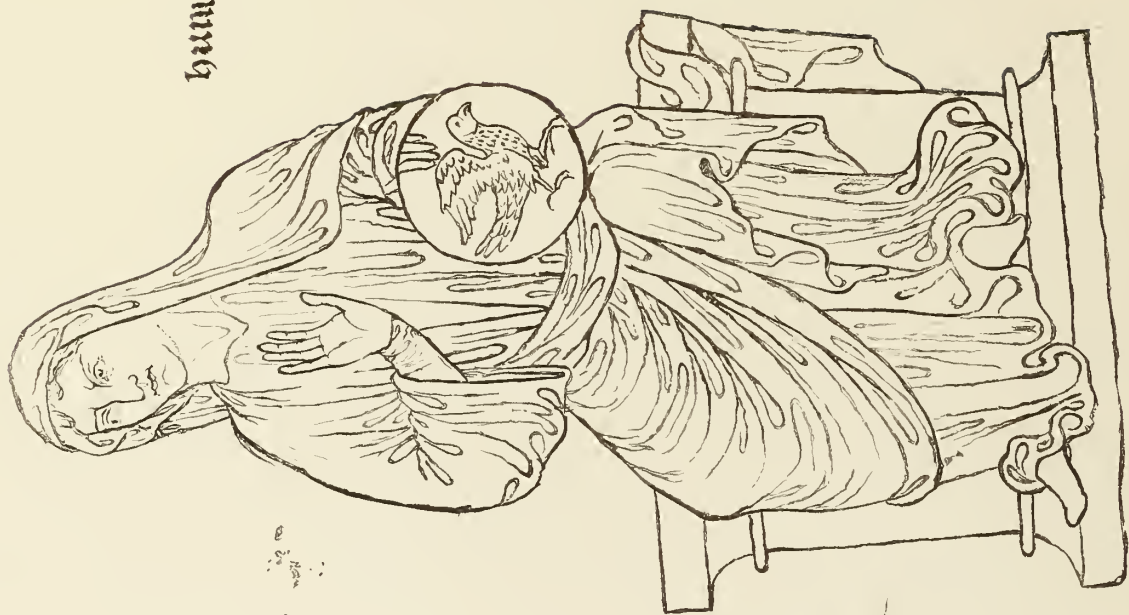


PLATE IV.

VERSO OF THE SECOND LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *d*.

CHRIST on the cross nailed with three nails, sinking from exhaustion so as to throw all the weight of the body upon the arms. A cruciferous disk is fixed a little below the intersection of the arms of the cross in the place where the head should be. The letters I. N. R. I. are inscribed on the scroll nailed to the head of the cross. This figure is excessively contorted, rather in the manner of the fourteenth century than of the age in which Wilars lived. It appears to us to have been rather a study for a painting,—perhaps an attempt to escape from the conventional forms of the age,—than the sketch of a real piece of sculpture. A death's head has been rudely scrawled by a later hand on the ground where the cross is planted, but is omitted in the engraving.

humblyte



orguel di curme uarbuclie



24

PLATE V.

VERSO OF THE THIRD LEAF, (IT HAS NO DRAWING ON THE RECTO,) MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *f*.

“ ‘Orgieus esi cume il tribuche—Humilite.’ ”

“ L’Orgeuil trébuchant—l’Humilité.”

“ *Pride, and how he got a fall—Humility.* ”

The contrast of the Virtues and Vices, which has given to Prudentius the subject of the *Psychomachia*, a work that we find ornamented with most interesting but very ugly miniatures in the manuscripts of the ninth century, has also supplied the sculptors of the middle ages with a fertile theme, which they have developed in the doorways of the Cathedrals of Paris, of Rheims, of Chartres, and of Amiens. Thus in the sur-base of the central doorway of Notre Dame de Paris, the series of Virtues with their respective contrasting Vices is represented. The Virtues are female figures in half relief, seated, and bearing on a circular escutcheon their characteristic attributes; the Vices are shewn in circular bas-reliefs, carved in the stone beneath each Virtue.

Here, as at Notre Dame, Humility is seated in an attitude of perfect calm, and holds a circular escutcheon, on which is represented a bird with outspread wings, assuredly meant for a dove.

Pride here, also as at Notre Dame, is a cavalier shamefully unseated, his horse having fallen on his knees. The same contrast betwixt the repose of the lines in the figure of the Virtue, and the movement of those in the group of the Vice, exists in both these examples, namely, at the cathedral doorway and in the manuscript, so that it is very difficult not to believe that the drawing must be a memorial sketch of the sculptures at Notre Dame. We must, however, observe, that the indication of the dappled marking of the horse leads to the supposition that these sketches of Wilars de Honecort, with their decidedly marked outlines, are sketches or studies for a painting on glass or on vellum ^h.

In the plate, Humility is seated, clothed in a loose upper robe with large sleeves, and reaching nearly to the ankle. It is confined at the waist by a folded girdle; a long tunic which extends below the feet, and has tight sleeves ter-

^h The drawing may have been made from a painted horse and other details would have been inserted statue, or bas-relief, in which case the marking of the exactly as in a picture.—(W.)

minating at the wrist, is seen beneath it; a veil covers her head and shoulders. Her left hand grasps the upper edge of the disk bearing a dove, which rests on her knee. Raising the right hand, she is looking at Pride, who is stumbling in the mud. The disordered state of the cavalier's dress permits us to examine some parts of the civil costume of the thirteenth century, which are seldom exhibited. Beneath his long mantle, which floats in the air, this cavalier wears a tunic reaching below the knee, with tight sleeves, girt about the loins with a belt, and opened behind, as it probably is in front. This opening shews the breeches and the "chausses," or long stockings which cover the whole leg and foot, and rise above the knee over the breeches; a pointed spur is attached to each heel. The head of Pride is uncovered, and his hair is bound by a simple twist. We are not to suppose that this costume was peculiar to horsemen, for poems and miniatures shew us similar hose, head-dresses, and mantles in ordinary use, as, for example, in the seated figure of plate xxiii. ; but the representation we find here is valuable because it furnishes information very rarely to be met with concerning the under costume. The only peculiarity worth mentioning with respect to the horse is the strongly marked nails of the shoes: the bridle with its curb, the square saddle called *à la Française*, and the stirrups, are of the forms usually seen.

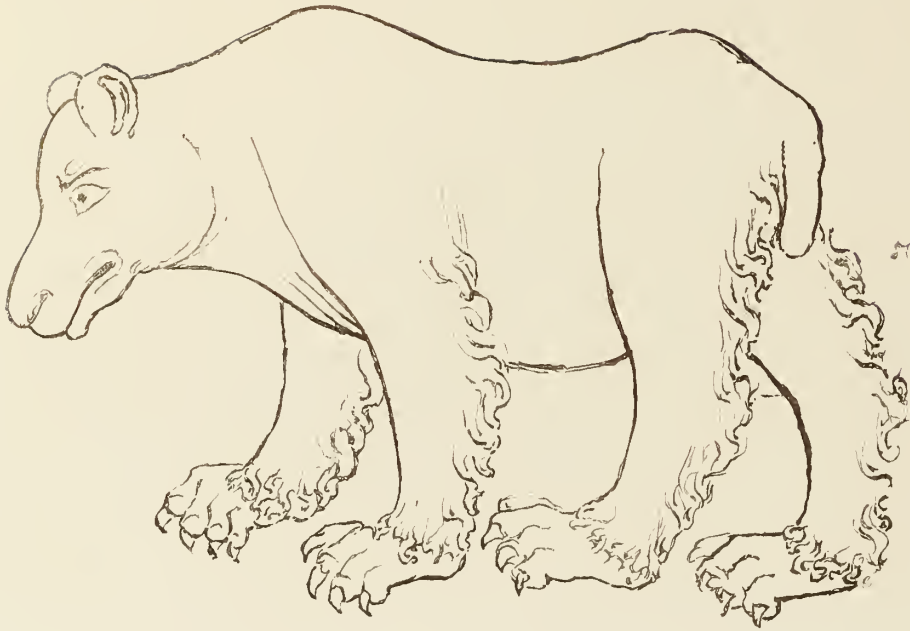


PLATE VI.

RECTO OF THE FOURTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *i*, AND IN THE FIFTEENTH WITH THE LETTER *d*; THE OMISSION OF THE TWO LETTERS *g* AND *h* SHEWS THAT ONE LEAF HAD BEEN LOST SINCE THE EARLY PAGING WAS MADE.

A BEAR.—This animal, the outline of which Wilars sketched with black stone before drawing it with a pen, is not mentioned in any of the Bestiaries¹, and the drawing must be a study from nature, like that of the lion which we shall see further on, as well as the graceful swan that is placed beneath it. Were these two animals destined for coats-of-arms, or are they sketches made with no other intent than to recal a beautiful or interesting object? The swan that sings before it dies, being the image of “the soul in joy or tribulation,” is always to be found in the Bestiaries. Beneath the swan is the symbolical representation of a town, indicated by an embattled enclosure with edifices of antique form rising above it, such as are sculptured above the canopies of statues to prefigure the celestial Jerusalem.

¹ In the symbolical systems of the middle ages the bear appears as the emblem of luxury, violence, or anger, and as such it was necessary for a painter to know how to represent him. Vide *Mélanges d'Archéologie*, t. ii. pp. 20, 33.—(W.)



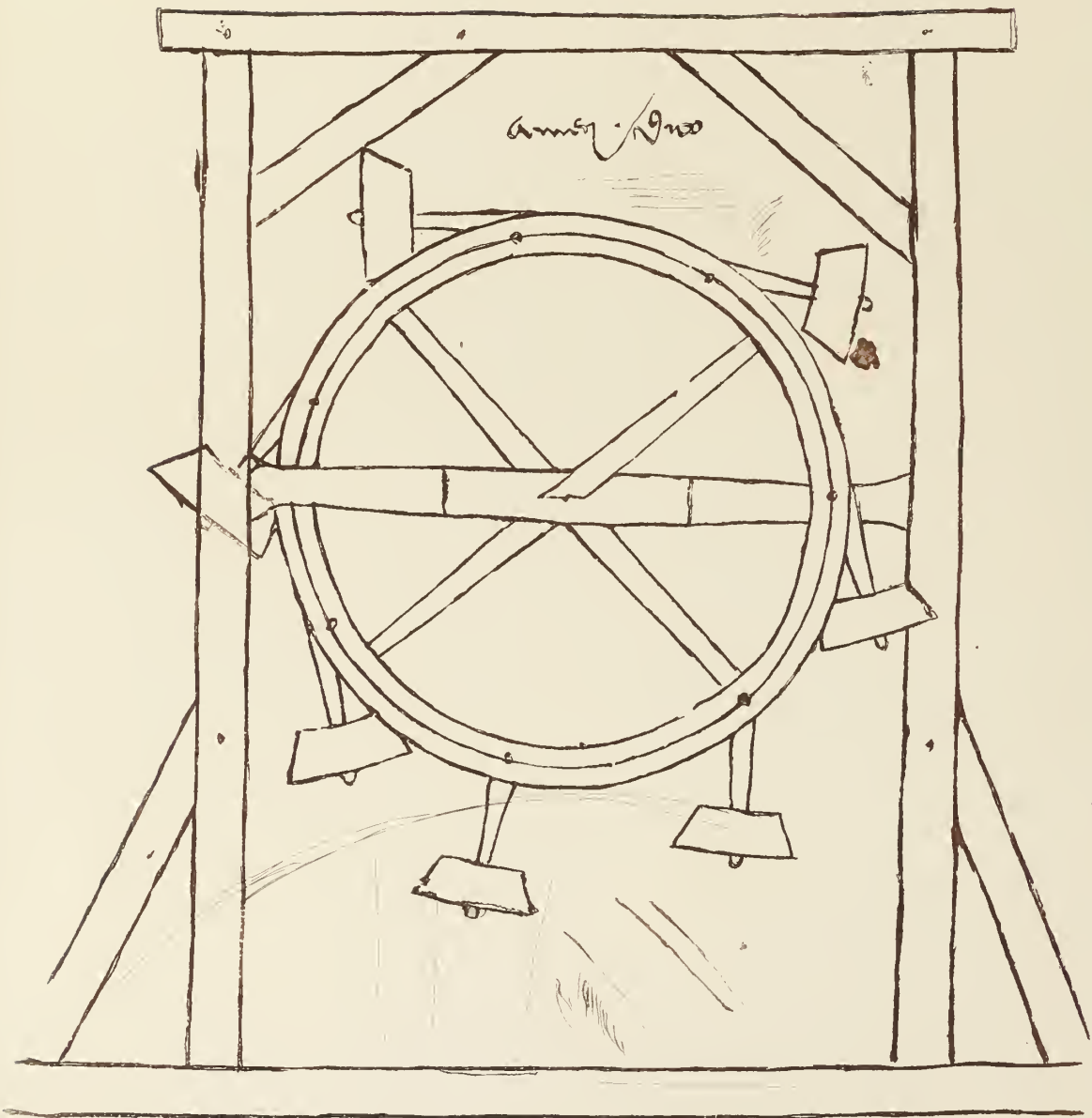
PLATE VII.

VERSO OF THE FOURTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE
LETTER *k* (?)

IN painted windows, in miniatures, and particularly in the sculptures of the thirteenth century, Christ on the Cross is frequently represented between the Church and the Synagogue, the living law placed on the right hand, and the dead law set aside on the left. The latter with a bandage over the eyes, to represent the blindness of the Jews, is letting fall from one hand the tables of the law, whilst the staff of the flag she holds in the other breaks to pieces, and the crown falls from her bowed head. The Church, crowned and erect, leans on the staff of a cross with a pennant, and holds in her left hand the "Saint Graal," a chalice filled with the blood that has flowed from the wounds of the Saviour.

It is this personification of the Church which is represented by the figure in the plate, and although we must regret that the artist should have drawn the features of the face so unhappily, we can but praise the design of the figure and the contour of the draperies. These draperies remind us by their multiple folds of those of certain statues at the west doorway of Rheims, and connect Wilars de Honecort with the school of artists of the thirteenth century of that district, whose works bear the impress of a careful study of the remains of classical sculpture, which must have then existed in their city in much greater numbers than at present. We shall shew, further on, the connection of his works with the Rhenish school, in which the sentiment of antiquity predominated during the whole of the thirteenth century.—(L.)

1 E 5



Maint on se sunt maistre despute de faire un uer une ruce
 par li seule uel ent ce cō en puet faire par maillet nonperel S
 par uifargent-

PLATE VIII.

RECTO OF THE FIFTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *l*, AND IN THE FIFTEENTH WITH THE LETTER *e*. [ON THE LEFT HAND OF THE FORMER LETTER ARE SEEN THE BLOTS PROCEEDING FROM THE SIGNATURE OF THE LAST PLATE.—(W.)]

“ ‘Maint ior se sunt maistre dispute de faire torner une rucee par li seule. Vesent ci con en puet faire par mailles non pers ou par vif argent.’ ”

“ ‘Maint jour, se sont maitres disputés pour faire tourner une roue par elle seule. Voici comment on peut le faire par maillets non pairs ou par vif-argent.’ ”

“ *Many a time have skilful workmen tried to contrive a wheel that shall turn of itself: here is a way to make such a one, by means of an uneven number of mallets, or by quicksilver.* ”

Wilars de Honecort presents to us a device for a perpetual motion; it is not clear whether he intends to claim the contrivance of it, or whether he had met with it in the course of his travels. It differs very little from a well-known contrivance for this purpose which has been so often published, and its fallacy so fully explained in popular books^k, that it is unnecessary to dwell at length upon the mechanical principles which it involves. It is extremely curious in this place, because it shews the great antiquity of the problem, the solution of which has wasted the time, the brains, and the means of many an unhappy artisan or philosopher.

In the drawing we have now before us, the two upright posts, which are framed together and skilfully braced so as to insure their steadiness, support between them a long horizontal axle, to the centre of which is fixed a wheel with four spokes. The absence of perspective in this drawing makes the wheel appear as if it were parallel to the frame, instead of being, as it is, at right angles to it.

Seven mallets, or arms, each loaded with a heavy weight at the end, are jointed at equal distances to the circumference of the wheel, so that those which happen to have their joints below the diameter of the wheel will hang freely down, but

^k For example, in Ozanam's or Hutton's mathematical recreations. M. Lassus has supplied an elaborate description, with demonstrations of the fallacy of this class of contrivances, which I have ventured to sup-

press, as it is to be found in books of such easy access as those I have referred to, and would scarcely be intelligible to persons unacquainted with mathematics.—(W.)

if the wheel be turned round by hand or otherwise, the weights of those which are on the ascending side will in succession rest on its circumference, and will in that position be carried over the highest part of the wheel, and downwards on the descending side, until the arms that bear them are brought into a vertical position and a little beyond it, and then the weight will fall suddenly over and rest on the opposite position on the circumference of the wheel, until its further descent enables it to dangle freely as before. The effect of this mechanism upon the position of the weights is not truly represented, for the upper mallet has fallen over too soon. In the modern form of this contrivance a pin, or stop, is introduced, by which the mallet when it falls over is compelled to rest, so that its arm shall point to the centre of the wheel, and thus the descending weight be held at a greater distance from the centre than when ascending. It is extremely probable that this difference is a mere error of the artist, for the drawing has the appearance of having been made from a model of the wheel at rest; a condition in which, of course, it would always be found, unless moved by some external force. The inventor seems to have thought that the action above described would always place four weights on the descending side, and leave but three on the ascending side, each weight as it rises to the top being intended to leap suddenly over to the descending side, in the manner just explained: or perhaps, as M. Lassus suggests, the contriver imagined that the blows given to the wheel in succession by the falling mallets would help it forward. It is surprising, that although the slightest model would shew the failure of devices of this class to persons incapable of mathematical reasoning, yet such machines have been seriously proposed in books, and are continually re-contrived by ingenious workmen. The allusion to quicksilver in the manuscript shews that Wilars was acquainted with the well-known contrivance described in the books already referred to, in which portions of that metal inclosed in channels are used instead of the falling weights.

M. Lassus ingeniously supposes that the first idea of this machine may have been suggested by the sight of wheels like this, with swinging hammers, which in certain churches were used instead of the bells on Good Friday¹, and which keep up their motion, according to the velocity acquired, some time after the moving power has ceased its action.—(W.)

¹ A Lenoir, *Architecture Monastique*, t. i. p. 157.

11-11



PLATE IX.

RECTO OF THE FIFTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE
LETTER *m*.

“Têtes de feuilles,” or foliage heads, as Wilars de Honcourt calls them below, in reference to other specimens of this style of ornament, (see plates xli. and xlii.), were much in use in the thirteenth century, in which they generally occupy the centre of small rosettes, or the tympanum space of a gablet above its arch. The Cathedral of Paris displays numerous examples of them. A foliage head is simply a human head in full face, the hair, eyebrows, and beard of which are transformed into leaves, which completely surround it. The elementary forms of these leaves, although fancifully curled and arranged, are studied from natural types, some of which Wilars has taken care to draw at the bottom of the page; one of them is a fig-leaf. The origin of these foliage heads may have been pagan. In fact, the vase of the thirteenth century which occupies the centre of the *Ecole des beaux-arts*, offers, amongst the heads of the gods of antiquity, that of a Silvanus, characterized by the leaves that surround it.

An ornament frequently used in goldsmiths' work is drawn below the two heads, and offers the greatest analogy with the crests and friezes of the shrine, or chasse, for the great relics at Aix-la-Chapelle^m, and of that of St. Eleuthère, at Tournay.—(L.)

^m Vide *Mélanges d'Archéologie*, t. i.

De tel maniere fu li sepulture dun
sarrazin q'io ui une fois

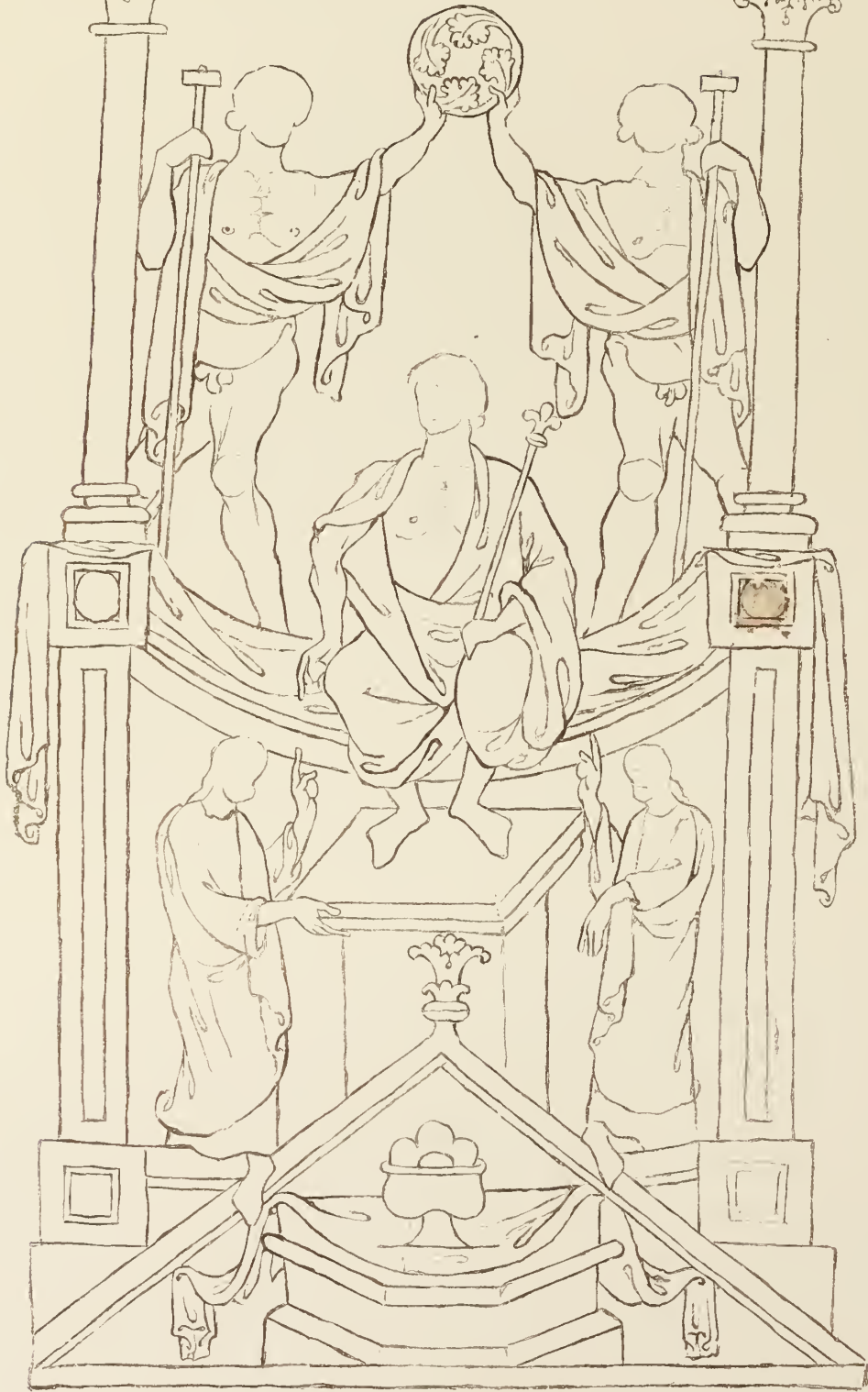


PLATE X.

RECTO OF THE SIXTH LEAF; THIS HAS NO PAGING OF THE THIRTEENTH CENTURY,
BUT WAS MARKED IN THE FIFTEENTH WITH THE LETTER *f*.

“ ‘De tel maniere fu li scpouture d’un Sarrazin q’ io vi une fois.’ ”

“ De telle manière fut la sépulture d’un Sarrasin que je vis une fois.”

“ *This is the representation of the sepulchre of a Saracen that I once saw.* ”

This tomb of a Saracen, or rather of a pagan, (for he who was not a Christian was a Mahometan in the eyes of a contemporary of the Crusades,) is apparently sketched from memory, and recalls by its disposition the diptychs of the Lower Empire. But the inscription leaves no room to doubt that it was a real sepulchral monument which Wilars de Honecort had in mind when he made this drawing. That he himself impressed it with its very manifest mediæval character is easily intelligible, for the faithful rendering of style in drawing is a quality entirely modern. Before Joseph Strutt published in 1789 his “Antiquities of England,” with engravings in which the Archaic character was as strictly preserved as was possible, no antiquarian had ever thought of attempting more than an approximate representation of the form of the monuments he was studying. But the drawings always possessed the character which prevailed at the time when the artist lived; and we who look upon ourselves as being so scrupulous in this respect, may, perhaps, hereafter be accused of the same fault in a lesser degree. Our architect of the thirteenth century was not more to blame in giving so mediæval a character to a monument of antiquity, than Montfaucon, Gori, and so many others were in presenting to the public representations of Greek, Egyptian, Byzantine, Roman, or Frankish figures, with the air and attitudes of the time of Louis XIV.

We are of opinion that in this picture, traced from a somewhat faded remembrance, Wilars de Honecort has introduced unwittingly the forms of some diptychs which he, whose active mind examined everything, must assuredly have inspected. We may suppose that his intention was to give the likeness of one of those two-storied tombs which were more commonly employed by the Gallo-Romans than by the other nations of the Roman empire. The principal personage is seated, with a flowered sceptre in his hand, just as Philip Augustus himself

might have sat on his throne, and the two half-clad genii, which carry each of them a thyrsus in one hand, support with the other, high above his head, a wreath ⁿ, which is, however, composed of trilobed leaves. The bases and capitals of the columns, the vases above, transformed into the likeness of the cruets employed for the service of the mass, the pax filled with holy wafers in the tympanum below, and the finial which crowns the pediment, are all Gothic, whilst the draperies recal the Byzantine or Carolingian age^o. Whatever may be thought of these transformations, this drawing is very interesting, for it shews that the mediæval artists had more respect for the works of antiquity than is generally supposed, and that its architects attempted to imitate them in their constructions as the troubadours did in their poems ^p.—(L.)

ⁿ A Roman basso-relievo, published by Montfaucon, retraces nearly the scene of the upper part of the drawing. (*l'Antiquité expliquée*, Supplement, t. iv. pl. 18.)

^o The Memoirs of the Royal Academy of Turin give a very interesting example of the singular manner in which archaeological fidelity was understood in the sixteenth century. It is the reproduction of a drawing executed at that time at Jorée, and preserved in a manuscript collection of inscriptions, from whence it was taken by M. l'Abbé Gazzera, who has inserted it in his memoirs entitled, *Del ponderario e delle antiche lapidi Eporediesi*. The inscription, very faithfully copied, is as follows:—

AVRELI VITALIS CENTVRIONIS
LĒG. IIII FLA QVI VIXIT.....

But the Aurelius Vitalis, centurion of the fourth legion, to whom it applies, is represented, not as a Roman horseman, but as a knight in complete armour of the sixteenth century, attended by a squire dressed

in the same style. The armour and attitude are such as would suit the Chevalier Bayard or the Maréchal de la Palisse, whilst the inscription itself is very exact, and leaves nothing to desire. This fact, which might furnish a very interesting page for the future history of archæology, should there ever be found any one to write it, is recorded in the *Memorie della reale Accademia delle scienze di Torino*, (t. xiv. p. 26, n^o. 12, and pl. 5,) and was pointed out to me by M. Longpérier, a member of the Institute. (A. D.)

^p Upon this design M. Quicherat remarks that "*murs sarrasins*" is a mediæval term always meaning Roman ruins. Wilars de Honcourt has given a representation of what he conceived to be a tomb, but has probably mistaken its object. The subject is rather the divine honour paid to an emperor. Above, Romulus and Remus hold up a crown of foliage. The emperor is seated on a "pulvinar," and at his feet is an altar served by two Augustals. (*Revue Archéologique*, p. 215).—(W.)



cest li macons



Don ozologe

Ri uet faure le maro d'une
 ierloge uel ent a une q'io
 u une foif. Li p'mierz
 estages de desol est quares
 a. iij. paignonciaus.
 Li estages de seure est
 a. viij. paignaul. z p'us
 couertic. z p'us. iij.
 paignonciaus. entre
 . ij. paignoul. z
 espalle. Vnt.
 Li estages tol de seure
 sest q'ies a. iij. pag
 nonciaus. z li cobles
 a. viij. coltes. Vnt
 aluce le portraic.

PLATE XI.

VERSO OF THE SIXTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER O.

“C’cst li masons don orologe.

“Ki velt faire le maizon dune ierloge ves ent ci une que io vi une fois. Li premierz estages de desos est quarés a .iiij. peignonciaus. Li estages deseure est à viij peniaus et puis covertic. et puis .iiij. peignonciaus. entre .ij. peignons .i. espasse wit. Li estages tos de seure sest quarés à .iiij. peignonciaux. et li combles a .viii costés. Ves aluec le portrait.’”

“C’est la maison d’une horloge.

“Qui veut faire la maison d’une horloge, en voie ici une que j’ai vue une fois. Le premier étage inférieur est carré à quatre pignons ; l’étage de dessus est à huit panneaux et puis [une] couverture, et puis quatre pignons. Entre deux pignons [il y a] un espace vide. L’étage le plus élevé est carré à quatre pignons, et le comble a huit côtés. Comparez avec le portrait.”

“*This is a clock-house.*

“*Whoever wishes to make a clock-house may view here one that I once saw. The lowest or first story is square, and has four gablets; the story above it has eight sides, then a roof, and upon that four gablets, but between every two gablets is a broad space; the highest story is square, with four gablets and an eight-sided roof. Compare the description with the portrait.*”

This inscription, of which the title is written with a different ink, and apparently by a different hand from the rest, describes summarily the general appearance of the edifice or clock-case in question. It must have been of limited dimensions, to judge from the slight inclination of the perspective lines of the sketch, which seems to have been made from the existing object. It was probably an interior clock-turret, like those which are still to be seen within the cathedrals of Rheims, Beauvais, and others⁹. The different stories are intended for the reception of bells, dials of various kinds, and automaton figures, which are set in motion at periodic times by the mechanism of the clock, to strike the bells, or perform evolutions representing scenes from Scripture, or legends.

⁹ At Lyons and Strasbourg, for example. The clock-case at Lyons, in the north transept of the cathedral, rises in the form of a tower, about thirty-five feet high, square in the lower stories, and octagon in the upper, gradually diminishing in diameter, after the manner of the clock-house of Wilars de Honcourt. Although its style is that of the sixteenth century, when it was made, its arrangement was pro-

bably suggested by the general form of the previous clock-house. The clock at Strasbourg, made in 1574, is a complex edifice with three turrets. Those of Rheims and Beauvais have no resemblance to the one represented in our manuscript. They are engraved in Gailhabaud’s *Architecture*, t. iv., and the two former in Dubois’ *Histoire de l’Horlogerie*.—(W.)

That it was made of wood is shewn by the slender dimensions of the architectural members, and especially by the horizontal lintels which occur in the lower and upper story. In style, the semicircular arches indicate the Romanesque period, while the elegance and lightness of the general design place it at the latter end of that period, or even after the introduction of the Pointed arch. For although that form is not employed in the arches of this design, it must be remembered that the art of working in stone was always in advance of the working of metal and wood^r.

The plan of this clock-case is easy to understand. First we have a basement story, square in plan, and having a shaft at the angles; each face is surmounted by a horizontal cornice, upon which rests a triangular gable, foliated with semicircular foils or lobes. The lower cusps are sustained by diminutive shafts; between each gable is a little turret or pinnacle.

Above the basement the construction becomes octagonal, and according to M. Lassus the passage from the square to the octagon is effected by forming the roof out of twelve triangular pieces arranged three by three. The drawing rather appears to indicate that the octagon rises immediately from a flat floor fixed at the level of the cornice of the basement story, and that the gables rise vertically, without any connexion with the roof behind them, the contrast of the octagon and square being disguised by the pinnacles at the angles^s.

The second, or octagonal story, has its angles marked by a post, or style, and each face has an arcade of two arches, supported by a central shaft and two semi-shafts, or responds.

The third story is also octagonal, but of less diameter than the second, and the connexion between the two is simply effected by a sloping roof of eight pieces. The vertical sides or panes of this story are alternately square and gable-shaped, the former shape having a single semicircular arch, and the latter a trefoil arch with semicircular lobes. The upper story is square, but placed in such a position that each angle coincides with the apex of the gablet below. Thus the transition from the octagon to the square is simply effected by four sloping boards, each in the form of a trapezium, which connects the upper edge of the square face of the lower story with the lower edge of the upper story, while its sides rest on those of gablets to right and left. The square story, like the basement story, is capped by a horizontal cornice-moulding, above which are triangular gables with a cross

^r In the remainder of this description I have not followed Lassus.—(W.)

^s The edge of the octagonal basement covered with

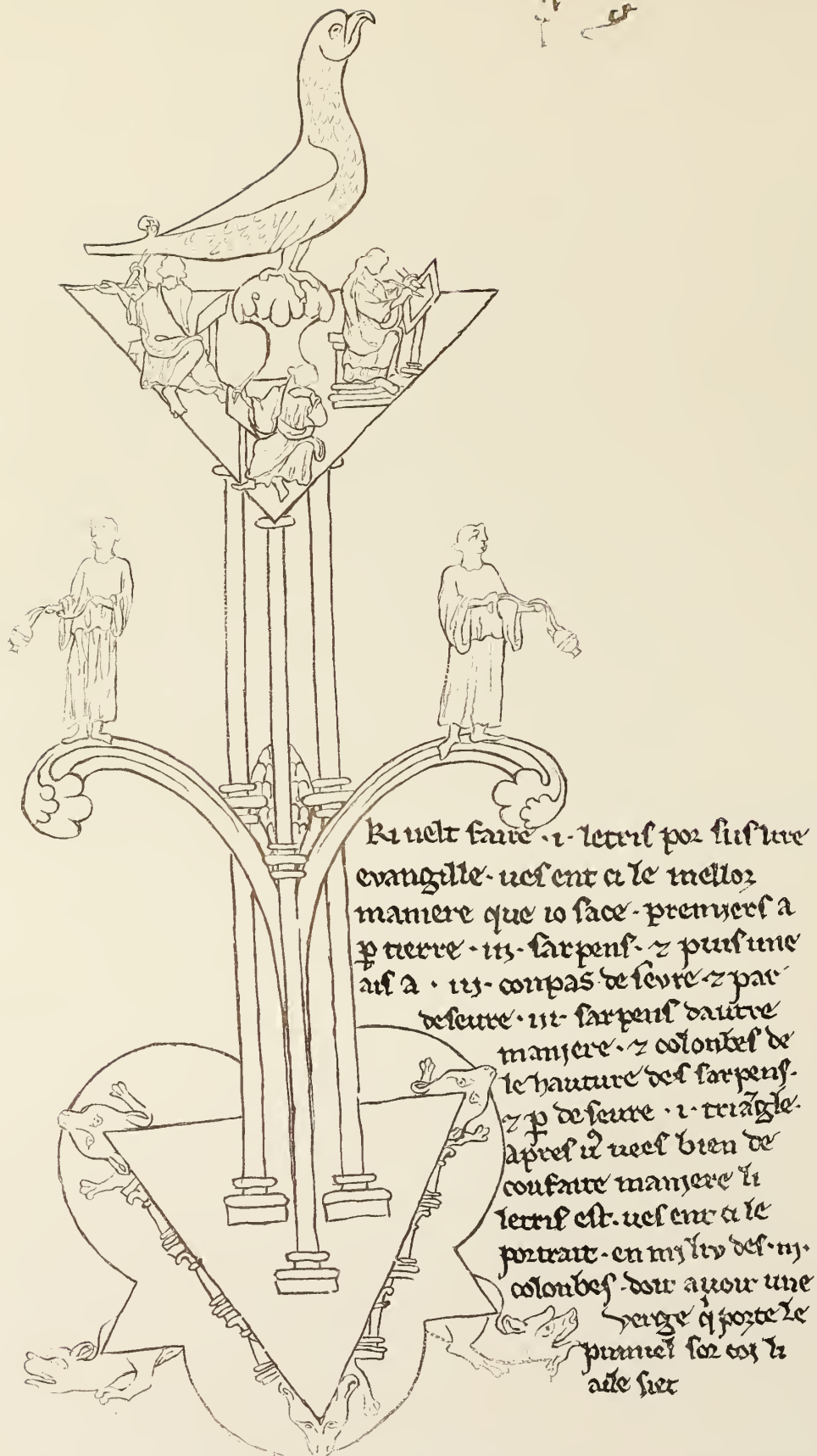
tiles is distinctly drawn on the right-hand side, rising vertically behind the angle-turret or pinnacle.

upon each apex. There is a shaft at each angle, the capital of which supports the cornice; and in addition, each face of this story is ornamented with an arcade of six small semicircular arches on very slender shafts; the whole is crowned by an octagonal spire.

The roofs and the spire are carved in representation of tiles or shingles.

The front face of the basement story is divided into two by a monial, but the lateral face has none; similarly, the front face of the upper square story has six arches, and the lateral face appears to have but three. Are we to conclude that these lateral faces were really narrower, and therefore that the plan was a rectangle, instead of a true square, or that want of perspective skill prevented the artist from introducing the missing members? In all clock-turrets, however, a square lower story is provided to contain the principal mechanism and to exhibit the great dial. This dial could not have been placed on that face of the lower story which is divided by a monial; I therefore infer that the left-hand face was square, and intended for the dial, and that it was really of the same width as the other. The monial may, however, be the meeting style of a pair of folding doors, provided to protect the dial.

In the upper corner of the page is a rich initial S, formed by a winged dragon with a foliated tail. This, amongst many other examples in the manuscript, serves to shew that the architects of the middle ages interested themselves in every branch of the fine arts.—(W.)



Ki uelt faire .i. leteral por sus l'ire
 euangille. uel ent a le melloz
 maniere que io face. premier a
 p terre .iij. sarpent. z puis une
 aul a .iij. compas de seure z par
 de seure .iij. sarpent d'autre
 maniere. z coloubes de
 le hauteur des sarpent.
 z p de seure .i. triagle.
 apres u uel bien de
 coufaite maniere li
 leteral est. uel ent a le
 portrait. en m' l'iv des .iij.
 coloubes. dor auoir une
 verge q porte le
 premier sor cor li
 aile s'ier

PLATE XII.

RECTO OF THE SEVENTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *p*, AND IN THE FIFTEENTH WITH THE LETTER *g*.

“ ‘Ki velt faire .i. letris por sus lire evangille. ves ent ci le mellor maniere que io face. Premiers a par terre .iij. sarpens et puis une ais a .iij. compas deseure et par deseure .iij. sarpens d’autre maniere. et colonbes de le hauteur des sarpens. et par deseure .i. triangle. Apres vous veez bien de confaite maniere li letris est. Ves ent ci le portrait. En mi liu des .iij. colonbes doit avoir une verge qui porte le pumiel sor coi li aile siet.’ ”

“ Qui veut faire un lutrin pour lire l’évangile dessus, en voici de la meilleure manière que je pratique. D’abord il y a par terre trois serpents et sur eux un ais à trois compas (trois lobes), et par dessus trois serpents dans l’autre sens, avec des colonnes de la hauteur des serpents; au-dessus est un triangle. Après vous voyez bien de quelle parfaite manière est le lutrin, dont voici le portrait. Au milieu des trois colonnes il doit y avoir une tige, qui porte le pommeau sur lequel l’aigle est posé.”

“Whoever desires to make a lectern to read the Gospel from, will see here the best form which I construct. Three serpents rest on the ground, and upon them is fixed a plank in the form of a trefoil. On this rest three serpents in a different direction, with columns of the same height as those serpents, and above is a triangle. Over all you see how perfect is the form of the lectern, of which you have the portrait. In the middle of the three columns there must be a stem to carry the pummel upon which the eagle is placed.”

Wilars de Honecort, having commenced the description of his lectern, breaks it off short, as if he thought it better to trust to his pencil than to his pen to convey a perfect idea of its beauties. He has merely given an explanation of a few details which his imperfect perspective had somewhat obscured †.—(L.)

The whole legend, as M. Quicherat pertinently observes, is an excellent example of the poverty of the language of the thirteenth century in respect of the details of architecture and ornament. It proves that the artisans of this period made a quantity of things for which they had no specific names. Little else can be gathered from the description in question, than that the fantastic reptiles which we call dragons, chimeras, and salamanders, were known

† Thus the three columns, which are placed on each side between the upper serpents to support the triangular base-plate, have their shafts inclined inwards

in the drawing, whereas if they had been drawn upon true principles, with their shafts vertical, they would have been distinctly shewn.—(W.)

to the cotemporaries of Wilars as serpents, and that the contour for which we have invented the name *trefoil*, or *trilobe*, was then described as *à trois compas*, i. e. as a form composed of three arcs of circles^u. The last figure has between each arc an angular piece, as if a triangular plate were placed below the trefoil. This is a very common form, but has even now no distinct name.—(W.)

The lectern is shewn by the slenderness of its parts and the multiplicity of its elements to have been probably of metal^x. It consists essentially of a base and an abacus, united by a central pillar formed of three ringed shafts. The base is composed of two metal plates, connected together, as our author has stated, by a serpent beneath each angle of the triangular plate, and by three intermediate dwarf pillars with thirteenth-century shafts and capitals ranged under each side of this triangle; the whole base resting upon three other serpents, whose heads are placed between those of the upper ones. The top plate, or abacus, is triangular, and has at each angle a statuette of an Evangelist seated, with a desk in front of him,—one of them is writing, another has the pen resting on the page, but is in meditation, the third is turning his head to look backwards. In the middle is the eagle, grasping with his claws a knob, whose stem descends in the centre of the group of three ringed shafts, which constitute the connecting pillar. The stem of the eagle may be supposed to rest in a socket on the pine-apple which is seen at the level of the middle rings of the shaft, so as to allow the eagle to be turned about. The pine-apple is of course the upper end of a second central stem which is fastened to the base, and from which arise two volutes which issue from it through the spaces between the ringed shafts. Probably a third volute branches out in the opposite direction, but is concealed by the shafts. Each volute supports the statuette of a deacon purifying with his incense the air which rises from the pestiferous serpents below, ere it reaches the peaceful region above, where the Evangelists proclaim the Word. Only three Evangelists are represented, but the eagle of St. John figures the fourth^y.—(L.)

^u *Revue Archéologique*, vol. vi. p. 221.

^x The word *ais*, used by Wilars for the lower plate, seems to imply that it was of wood, yet the whole appearance of the machine justifies the supposition of M. Lassus, that it was made of metal. Possibly the lower plate was, for the sake of stiffness, made of wood covered with metal.—(W.)

^y In the Cathedral of Messina there is a bronze lectern differing but little from this one. It divides

itself into five branches. The four lateral branches bear each a desk, formed by one of the evangelical animals, with outspread wings, which is reserved for reading the Evangelist it represents. The central branch is surmounted by a pelican, which crowns the work. Mr. Digby Wyatt has published this lectern in his 'Metal-work.' It is of the fifteenth century, and as I imagine, of German workmanship.—(A. D.)

9

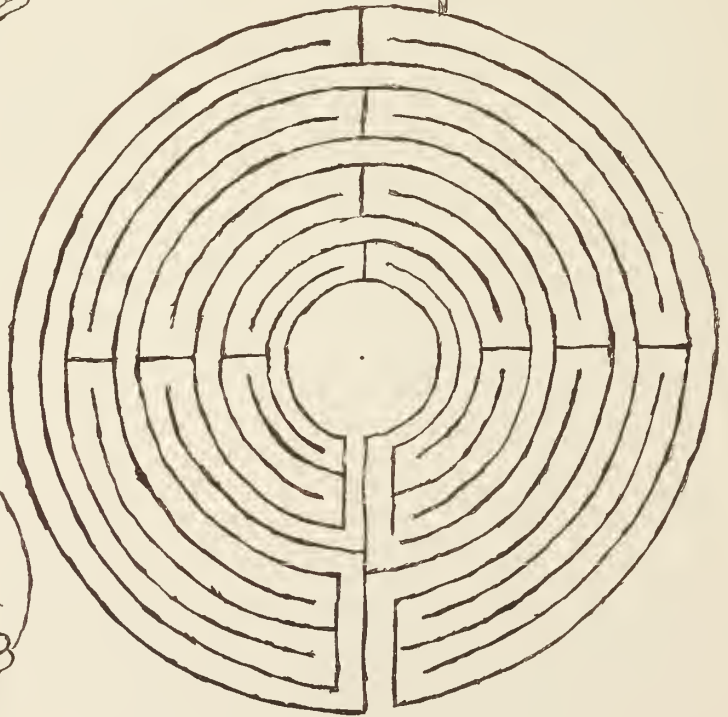
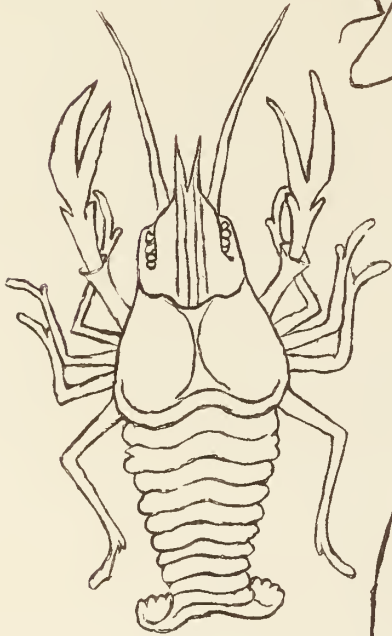
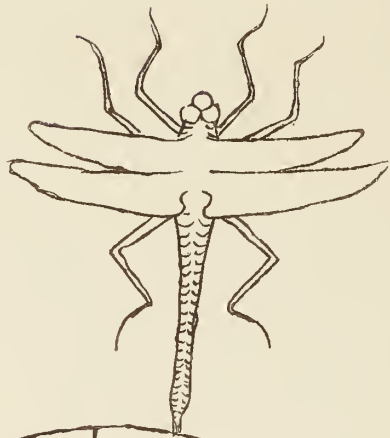
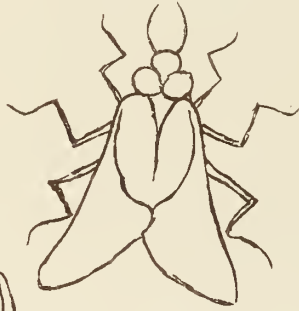


PLATE XIII.

VERSO OF THE SEVENTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH
THE LETTER *q*.

A GRASSHOPPER, a cat, a fly, a dragon-fly, a crayfish or lobster, a dog coiled up, and the plan of a labyrinth occupy this page. Although these animals seem to have been drawn with no especial end in view, we may call attention to the fact that a crayfish absolutely similar to this one is sculptured on the jamb of one of the doors of Notre-Dame at Paris, amongst the signs of the zodiac, and that the grasshopper might, in the absence of a real scorpion, assist in representing that sign. Moreover, in a personification of the different months, the cat might well find a place in the chimney-corner where February is warming her feet. The dog seems from his position to have been studied with a view to ornament a corbel under some statue.

The labyrinth is identical with the one which is delineated on the pavement of the cathedral at Chartres, but traced reversely, as may be seen by comparing the sketch with the plan of the real one in plate 65^z.

The believer who, in the middle ages, followed the mazes of such a labyrinth, was held to have performed, without going out of the town, a pilgrimage to the Holy Land, which others were prepared to undertake with arms in hand. The labyrinth was in those days what the "road to the cross," with its numerous stations, is now; and this is the reason that there used to be one in the greater part of the cathedrals, as at Rheims, at Amiens, at Beauvais, and at Bayeux. In their centres the architects were wont to place figures of themselves, as at Rheims^a.—(L.)

^z Vide the explanation of plate 17.

^a In the "Archæological Journal" for September, 1858, there is an admirable memoir by the Rev. Edw. Trollope, entitled, "Notices of Ancient and Mediæval Labyrinths," with abundant illustrations, in which the history of these remarkable objects is completely traced through their different forms of

the Dædalian architectural labyrinth of antiquity, the ecclesiastical pavement of the middle ages, with its symbolical and spiritual allusions and its employment as an instrument of pilgrimage and penance, concluding with the English rural maze and the universal topiary maze formed of clipped hedges. —(W.)

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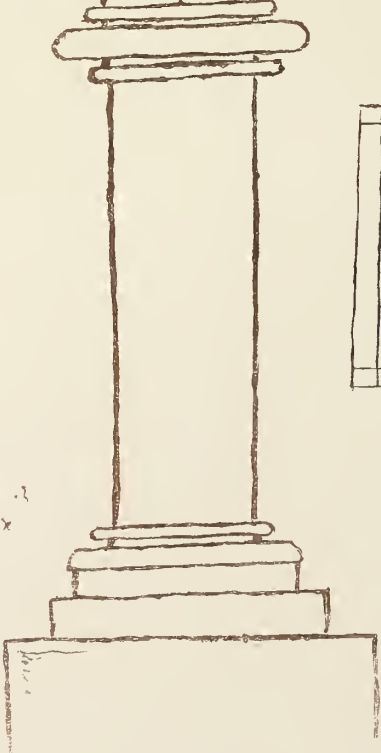
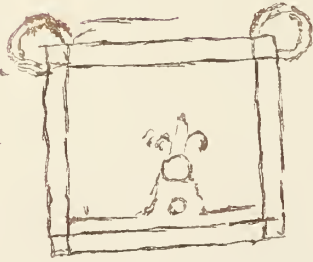
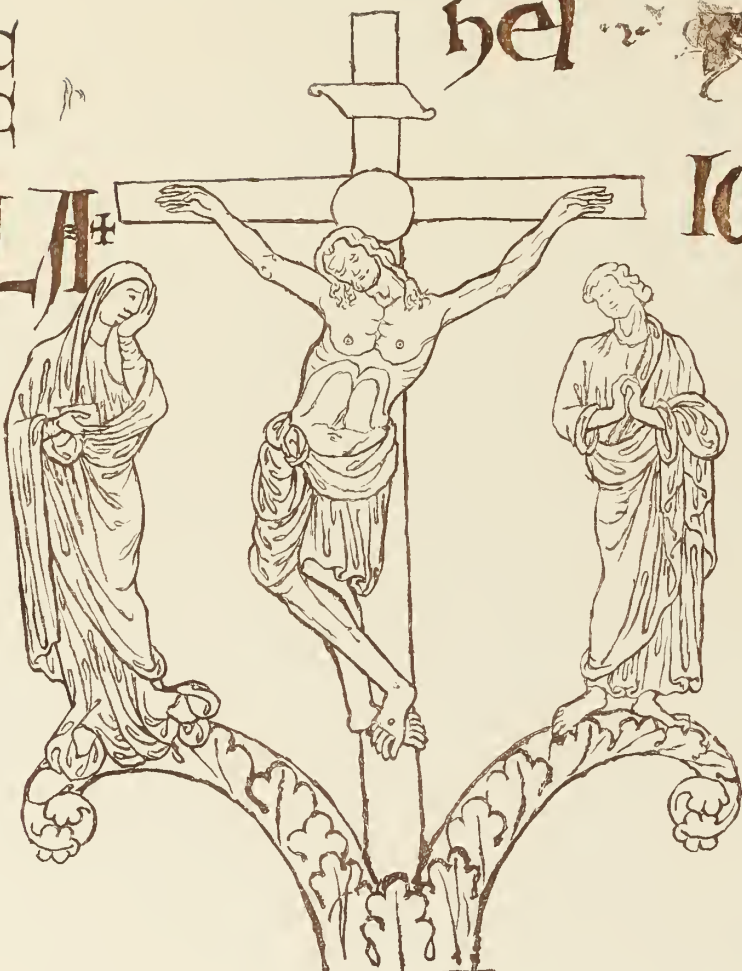


PLATE XIV.

RECTO OF THE EIGHTH LEAF, MARKED IN THE THIRTEENTH CENTURY WITH THE LETTER *r*, AND IN THE FIFTEENTH WITH THE LETTER *h*^b.

A MONUMENTAL CROSS.

From the summit of a dwarf column which stands on a base and plinth, and is surmounted by a triple ring forming its abacus, or rather its neck-moulding, there springs out a pair of foliated volutes in opposite directions, like an exaggerated capital: the one bears the statue of the weeping Virgin, the other the statue of St. John with folded hands. Between these two figures is a crucifix, almost identical with that of plate 4, with the exception of a slight variation in the drapery. Whether intended for an external cross, or for a roodloft, the design is extremely beautiful. If this contorted Christ has not the grave solemnity of the upright form like that in the museum of the Hotel de Cluny, there is no doubt that had it been executed with the anatomical precision indicated by Wilars de Honecort, it must have formed a magnificent composition with the two robed statues that accompany it and are so well balanced. Certainly the artist must have possessed the feeling of harmony in the highest degree to have traced with so firm a hand these two statues, so different in their movement, and yet their outlines seeming to have been the one traced from the reverse of the other.

Greek inscriptions in uncials designate each personage. There is, first, † IHC † X[†]C, for the Christ; then for the Virgin † AGIA †, probably intended for ΑΓΙΑ, which stands for either ΠΑΝΑΓΙΑ, 'all holy,' or ΑΓΙΑ ΜΗΤΗΡ, 'holy mother.' On the side of St. John, the letters IOTHE must be meant for ΙΩΑΝΝΗΣ Ο ΘΕΟΛΟΓΟΣ, 'John the theologian.' Finally, the three letters over the cross, hE!, may signify ΗΛΙΟΣ, 'the sun,' the figure which was commonly placed on the right arm of the cross, accompanied by the moon on the left. These letters may also signify 'the Lord,' as in the inscription of the altar at Bâle, which now belongs to the museum of the Hotel de Cluny. The little crucifixion figured at the base of the leaf, in which the order of the personages seems to be inverted, is drawn with a much lighter hand than that of Wilars, and was added in the fourteenth century. The ring roughly traced at the top of the border of this drawing, and the frame which is added as a pendant to it on the other side of the cross, are the scrawls of an unskilful hand of much later date.—(L.)

^b This is the first leaf of the second quire.—(W.)



PLATE XV.

VERSO OF THE EIGHTH LEAF, BEARING NO MARK.

Two cavaliers confronting each other, armed only with shield and lance; they are habited in a simple tunic, girt about the waist, and have their spurs fastened on over their chausses, or long hose. One of them has his head covered, and that only with the civilian tight cap, or "beguin." However, they have already broken lances, for the point of one is stuck in the shield of the cavalier on the left. The lances in their hands have no points, but in the manuscript the reason of this is apparent; they are, in fact, concealed because the fold of the sheet in binding has passed across the lances, as may be seen by referring to the representation of the corresponding half-sheet in plate 26.

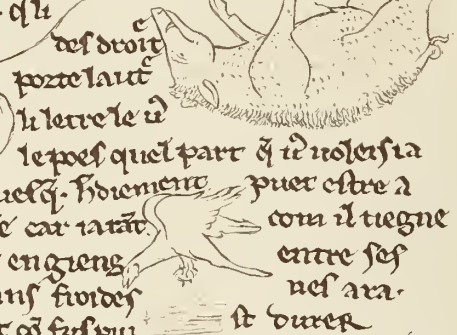
It may be a question whether these two cavaliers form part of a composition left incomplete, or whether they be intended to prefigure Anger, as the figures in plate 5 represent Pride and Humility, and those of plate 26 either the month of May or the seductions of Vice.

The hand that has amused itself in scribbling over other drawings in this collection has in the manuscript drawn a tree on the right-hand shield, round about the rosette that forms its centre.—(L.)

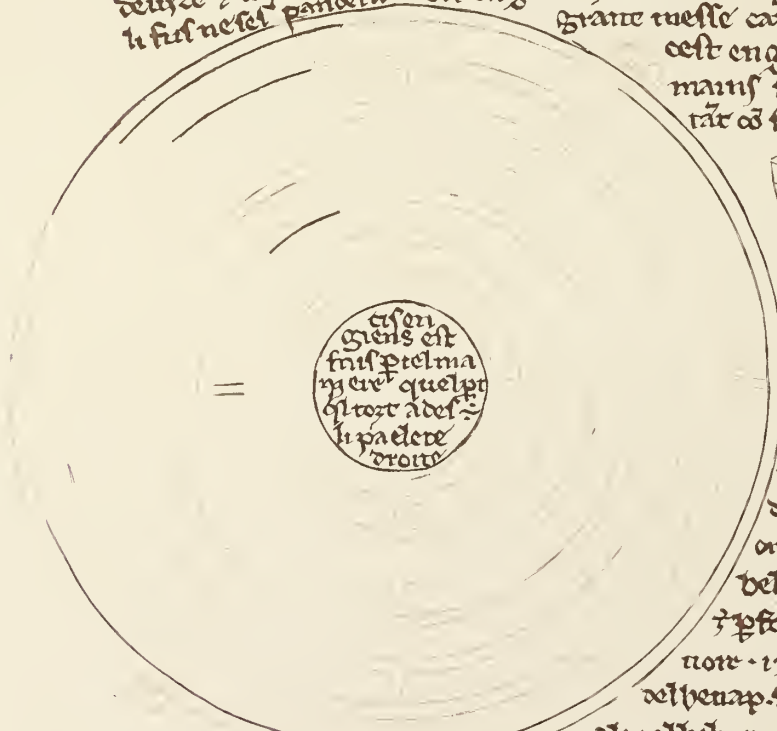


Keurre dort
 Keurre-fas
 .13. tozeillons
 estre une paete
 tozeillo doivent estre cangiet en tel manere . q li
 pliere al fo demeure a
 Car luns des tozeillons
 z se u te faitel a droit figon
 deuze z li portature . ^{Cozner}
 li fait nesel pandera . Cest engiens

Et se u uoleis faire
 .1. escalfaire demais
 uol ferel ausi come
 une pume de keurre
 de .13. moines clozeice .
 Par dedens le pume de
 auotr . Si cercles de
 cuns des cercles a
 z eul enmi ho dort
 te a .13. tozeillons . La



des droit
 porte laut
 li lettre le u
 le pes quel part q u uoleis fa
 puer estre a
 com il tiegne
 entre ses
 nes ara .
 st durep
 en cest egi
 eg na pl?



en son
 siens est
 fait prelma
 yere quelpt
 q toze adet
 li paete
 droite



Desca une camepleure co
 puer faire en .1. henap e
 tel maniere . qent enmi le
 henap doit auoir une tozete
 z eul enmi ho dele touzete
 doit auoir .1. behot . q regne
 oul el fous del henap . mais q li
 behot soit ausi lons co li henap
 z p fous . z eul en le tozete doit a
 uoir .13. trauecons p foudre le foud
 del henap . si q li unis del henap puit
 aler al behot . z p de leur le tozete doit auoir

.1. oriel q doit tenir so brec si bas q quant li henap iere plaiss quil bouce . a dont sen cora
 li unis p mi le behot z p mi le puet del henap q z doubles . z sentendes bien q li oriel
 doit estre crue

PLATE XVI.

RECTO OF THE NINTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH
THE LETTER *i*.

“Vesci une cantepleure con puet faire en .i. henap en tel maniere q’ens enmi le henap doit avoir une torete et ens enmi lin de le tourete doit avoir .i. behot qui tiegne ens el fons del henap. Mais que li bchos soit ausi lons com li henas est parfons. Et ens en le torete doit avoir .iii. travecons par sontre le fons del henap. si que li vins del henap puist aler al behot. et par deseur le torete doit avoir .i. oisiel qui doit tenir son biec si bas que, quant li henas iert plains, quil boive. Adont s’en corra li vins par mi le behot et par mi le piet del henap qui est doubles. Et sentendes bien que li oisons doit estre crues.”

“Voici une chantepleure qu’on peut faire dans une coupe. Pour cela il doit y avoir au milieu de la coupe une petite tour, et la tour doit être traversée par un tube qui aille au fond de la coupe et soit aussi long que la coupe est profonde. De plus, il doit y avoir dans la tour trois petites traverses allant contre le fond de la coupe, afin que le vin de la coupe puisse entrer dans le tuyau ; et par-dessus la petite tour il doit y avoir un oiseau qui tiendra son bec assez bas pour qu’il semble boire quand la coupe sera pleine ; alors le vin circulera par le tube et par le pied de la coupe qui est double. Entendez bien que l’oiseau doit être creux.”

“This is a contrivance that may be made in a drinking-cup. In the midst of the cup is fixed a little tower, and in the middle of the tower is a tube that extends to the bottom of the cup, and the length of the tube is equal to the depth of the cup. There must be also three little cross-pieces to the tower touching the bottom of the cup, so as to allow the wine in the cup to enter the tube. On the top of the tower must be a bird holding his beak so low, that he may seem to drink when the cup is filled. Then the wine will run through the tube, and through the foot of the cup, which is double. It must be understood that the bird must be made hollow.”

This explanation is incomplete, and the drawing inexact in several particulars. The contrivance is a toy well known under the name of a Tantalus cup^c, and the purpose of the mechanism is that, when liquor is poured into the cup, and, gradually rising in it, approaches the brim, and seems ready to offer the expected draught, it shall suddenly vanish, to the amusement of the bystanders, being in fact conveyed into the hollow foot of the cup by the central tube, which acts upon the principle of the syphon, but is disguised in its form so as to appear merely as the ornamental pedestal of the bird.

^c See Hutton’s “Recreations,” vol. iv. p. 27, or any popular treatise on hydraulics.

The central tube must pass completely through the bottom of the cup, and enter deeply into the hollow foot, which must be capacious enough to contain more than the contents of the vessel, and be pierced to allow the air to escape: the upper end of the tube must not rise so high as the brim, as Honecort states, but must stop a little short of it. The tower, as it is called, is in the form of an inverted thimble of greater diameter than the tube, and must be supported upon short legs below, so as to fix it firmly in a position concentric to the tube, and yet to allow the liquor when poured into the cup to enter freely between the inside of the thimble and the outside of the tube. The two together form what is termed an annular syphon, of which the tube is the long leg and the thimble the short leg. When liquor is poured in, it rises in the cup and in the syphon equally, until its level reaches the upper end of the tube; it then begins to flow into the tube and fill it, so that the syphonic action begins, and if the pouring be stopped the contents of the cup will instantly disappear by passing into the foot. But if the pouring be gradually continued, the surface of the liquor will remain at the same level, as if the bird was drinking it as fast as supplied. The bird has no connexion with the mechanism, as Honecort seems to think. Sometimes the hollow foot of the cup is omitted, so that the wine may run out at the end of the tube, and the spectators enjoy the additional amusement of seeing the unfortunate subject of their merriment with his clothes drenched^d.

This is a contrivance of considerable antiquity; it is to be found in the twelfth problem of the "Pneumatics" of Hero of Alexandria, as "a vessel from which the contents flow when filled to a certain height." The annular syphon is employed exactly as in the example given by Wilars, and the liquor simply runs out at the foot.—(W.)

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"Et se vos voleis faire .i. escaufaile de mains vos fereis ausi come une pume de keuvre de .ii. moities clozeice. Par dedens le pume de keuvre doit avoir .vi. cieres de keuvre. Cascuns des cieres a .ii. toreillons, et ens enmi liu doit estre une paelete a .ii. toreillons. Li toreillon doivent estre cangiet en tel maniere que li paelete al fu demeuret ades droite. Car li uns des toreillons porte lautre; et se vos le faites adroit si com li letre le vos devise et li portraiture, torner le poes quel part que vos voleis, ia li fus ne sespandera. Cis engiens est bons a vesque.

<sup>d</sup> Amongst the plate at Corpus Christi College in Cambridge, there is an ancient mazer-eup of the fifteenth century mounted in silver, in the centre of which is an hexagonal tower of silver surmounted by a swan, and having the central tube in all respects

corresponding to the description in the text. The lower extremity of the tube has been long plugged up, and the mischievous trickery of the machine forgotten.—(W.)

Hardiement puet estre a grant messe, car ia tant com il tiegne cest engieng entre ses mains, froides nes ara, tant com fus puist durer. En cest engieng na plus.”

“ Si vous voulez faire une chaufferette à mains, vous ferez comme une pomme de cuivre de deux moitiés qui s'emboîtent. Par dedans la pomme de cuivre il doit y avoir six cercles de cuivre. Chacun des cercles est muni de deux tourillons, et au milieu il doit y avoir une petite poêle à deux tourillons. Les tourillons doivent être contrariés de telle façon que la petite poêle à feu reste toujours droite, car chaque cercle porte les tourillons de l'autre. Si vous faites exactement comme la description et le dessin l'indiquent, vous pouvez tourner dans le sens que vous voudrez, jamais le feu ne se répandra. Cet engin est bon pour un évêque; il peut hardiment assister à la grand'messe, car tant qu'il le tiendra dans ses mains il n'y aura froid aussi longtamps que le feu pourra durer. En cet engin il n'y a rien de plus.”

*“ If you desire to make a chaufferette (calefactorium), or hand-warmer, you must construct a kind of apple of brass in two halves which fit together, inside the apple place six brazen circles, let each circle have two pivots, and in the middle place a little brasier with two pivots. The pivots must be placed in contrary directions, so that in all positions the brasier may remain upright, for every circle supports the pivots of the next. If you make this contrivance exactly as the description and drawing shews it, you may turn it about in any way you please, and the cinders will never fall out. It is excellent for a bishop, for he may boldly assist at high mass, and as long as he holds it in his hands they will be kept warm so long as the fire remains alight. This machine requires no further explanation.”*

In the drawing the outside ring represents the section of the spherical cover, and the inner circle the hemispherical bowl which contains the burning charcoal. Each pair of pivots is placed in a direction at right angles to the next pair in succession; the hinges and pins which served to connect the two halves of the outer sphere are also shewn in the drawing. The contrivance, under the name of gimbals, is in common use, principally to support marine compasses, chronometers, and other philosophical instruments, so that they may maintain the horizontal position during the rolling of the ship; modern science, however, has shewn that one circle, intermediate between the rolling frame and the object which is to be kept level, is perfectly sufficient, so that the other five which De Honecort has so liberally provided are entirely superfluous; and he might have suppressed them, and yet with equal truth have written, as he has done, the inscription which appears in the centre:—“ Cis engiens est fais par tel maniere quel part quil tort ades est li paelete droite.” (“ This machine is so made, that whichever way you turn it, the little brasier remains upright.”)

All the inventories of church treasures mention the calefactorium, or “ escauffaille à mains,” which they sometimes call the apple, or “ pomum.” Du Cange cites two from York, one of them described as “ unum calefactorium argenti deauratum cum nodis curiosis insculptis,” i. e., of silver-gilt, with curiously

engraved knobs. A copper-gilt specimen of the thirteenth century, in the collection of M. Carrand, shews that these knobs on the surface of the utensil were so sculptured as to furnish the apertures necessary for the supply of air to the fuel within<sup>e</sup>.

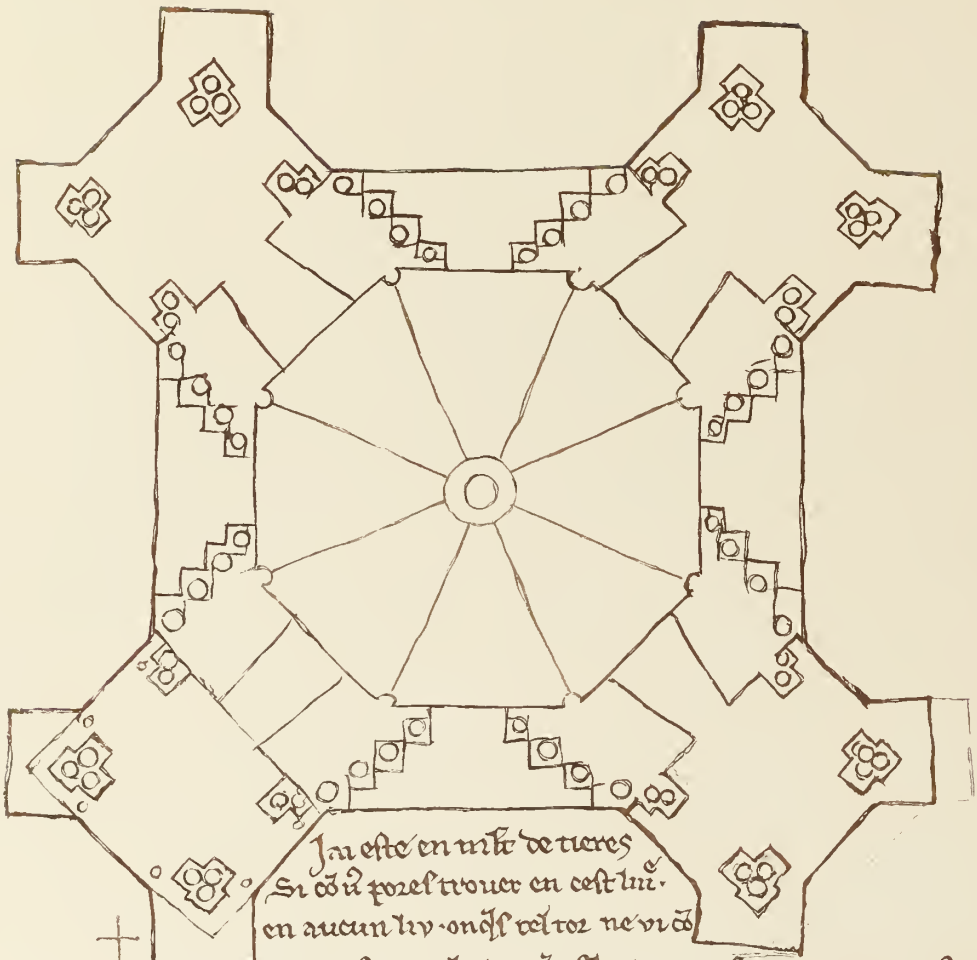
Wilars de Honcort, evidently before his descriptions were written, had made several sketches on the same page, which are turned the wrong way upwards. One represents a boar tracking a hare, which is couched, and nearly as big as himself. Both of the animals are very exactly drawn. There is also a group of two men playing at dice. The right-hand figure is seated cross-legged on the ground, and has a cloth loosely thrown over his chest and shoulders, but is otherwise naked to the waist. He wears loose breeches, reaching just below the knee, and twisted about his waist as if rolled over some kind of girdle. His legs, from the absence of the muscular lines which are so liberally bestowed on the other unclothed portions of his body, are evidently clad in stockings, and he has pointed shoes on his feet, slit down and laced laterally on the inside of the foot. He is employed either in placing or taking up certain coins or counters from the board, which rests on the ground between the two, and is engaged in an earnest discussion or dispute with his companion, who is seated on the ground opposite to him, with one leg bent under his body and the other extended. This man is clothed like the former, with the exception of the shoulder covering, but as his feet are concealed, and the portion of one leg, which is alone shewn, seems to bear a muscular line, it may be inferred that the stockings are absent, and possibly the shoes. He grasps the dice in his hand as if about to throw them on the board. The latter is conjectured by M. Lassus to be one of the shallow trays which the masons employed in the middle ages to convey their materials to the place where they were working, and he remarks that it resembles such a tray which he had seen in a manuscript. Accordingly he considers the group to represent two masons amusing themselves in their interval of rest by playing at dice; adding, that the natural attitudes of these men, and the careful delineation of the muscles of the arms and body, shew that the sketch was made from nature. M. Quicherat, on the other hand, describes the subject to be two slaves playing at dice, the one resembling a Greek, the other a barbarian<sup>f</sup>.

<sup>e</sup> The French editor mentions that Lassus once had in his hands a chaufferette about five English inches in diameter, of plain exterior, with hinges, and provided with four interior circles (like those of our MS.), and a central receptacle for a red-hot iron.

A row of little holes along the border of each hemisphere were apparently intended to stitch a cloth cover on the surface.

<sup>f</sup> *Revue Archéologique*, vol. vi. p. 219.





J'ai este en mlt de tierces  
 Si cō u' poret trouver en cest li.  
 en aucun liv. onq's tel toz ne vi cō

est cele deloō. uel cur ei le prem. es'gement. si con de l'p'miere fenest  
 res. A cest es'gement est li toz touce a. viij. arestes. sen se les. iij.  
 filloles quareel. seur coloubel de. trois. p'uis li ueneit arket z en  
 taulemens se re sunt les fillolel p'uis a. viij. coloubes. z tre. ij.  
 coloubel fait un' buel. p'uis ueneit arket z en taulemens. p  
 de seure sunt li conble a. viij. crestes. en calcune espale a une.  
 arkere por auoir clarte. es'gardel deuant u' sen uerels mlt

dele maniere z tote le montee. z si cō les  
 fillolel se emgent. z si pealerz car se il uoles  
 bien ouuer de toz graul pileel forkiel u'  
 couverte a voir q' asel aient col. prendel gard  
 en uostre a faire si ferel q' sagel z h'ortois



CHÆORALÆ · DE · CHARCRES

Labyrinthæ :

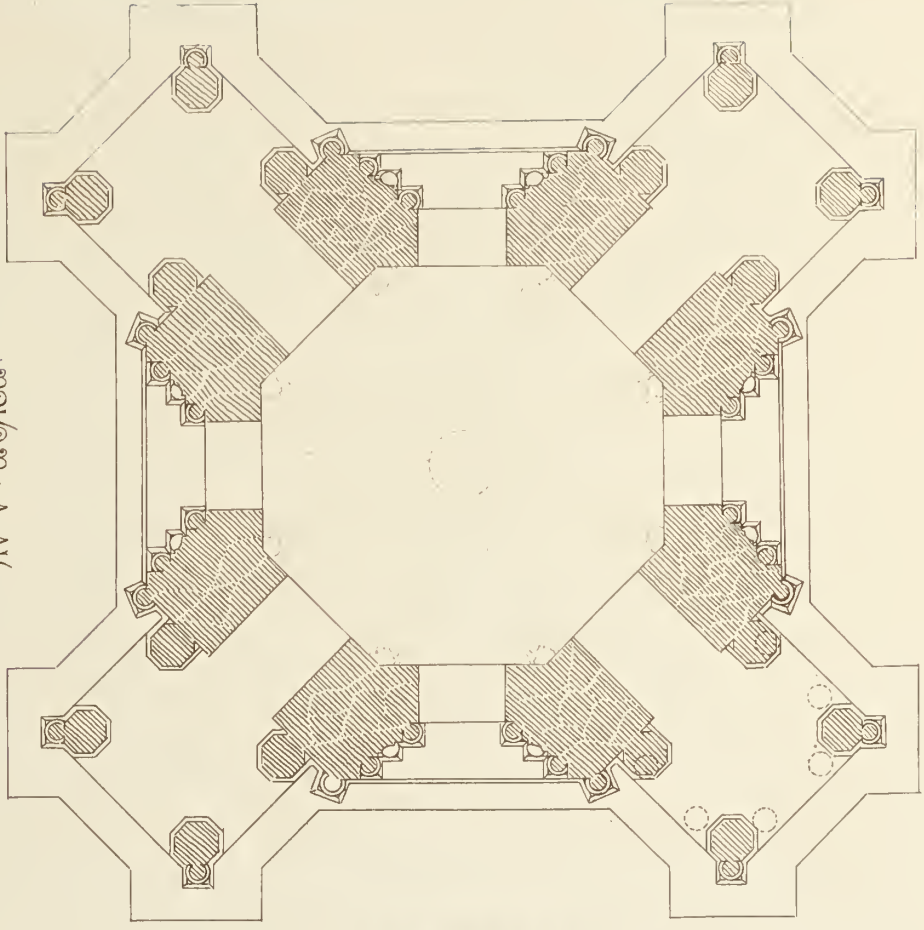


0 50 1 2 3 4 5 6 7 8 9 10 Mètres

NOTRE-DAME · DE · LAON

PLAN · DE · LA · COVR · DV · NORD ·

AV · V<sup>me</sup> · ÉTAGE :



0 50 1 2 3 4 5 6 7 8 9 10 Mètres





## PLATE XVII. AND XVIII.

VERSO OF THE NINTH LEAF AND RECTO OF THE TENTH LEAF, THE LATTER MARKED IN THE FIFTEENTH CENTURY WITH THE LETTER *k*.

“J’ai este en mult de tieres si com vos porez trover en cest livre. En aucun liu onques tel tor ne vi com est cele de Loon. Ves ent ci le premier esligement si con des premieres fenestres. A cest esligement est li tors tornee à .viii. arestes, sen sont les .iiij. filloles quarees seur colonbes de trois. Puis si viennent arket et entaulemens : se resunt les filloles porties a .viiij. colonbes et entre .ij. colonbes saut uns bues. Puis vient arket et entaulemens. Par de seure sunt li conble a .viii. crestes. En cascune espase a .unc. arkiere por avoir clarte. Esgardes devant vos sen vereiz mult de le maniere et tote le montee. Et si com les filloles se cangent et si penseiz car se vos volez bien ovrer de toz grans pilers forkies vos covient avoir qui ases aient col. Prendes gard en vostre afaire si ferez que sages et que cortois.”

“J’ai été en beaucoup de pays, comme vous pouvez le reconnaître par ce livre ; jamais en aucun lieu je ne vis tour pareille à celle de Laon. En voici le premier étage, avec ses fenêtres. A cet étage la tour est à huit faces, et les quatre tourelles sont carrées, sur colonnes groupées par trois. Puis viennent les petits arcs et l’entablement, et il y a encore des tourelles à huit colonnes, et entre deux colonnes un bœuf fait saillie. Puis il y a des arcs et un entablement, et par-dessus est le comble à huit crêtes. Sur chaque face est une meurtrière pour éclairer. Regardez devant vous et vous verrez toutes les dispositions et toute l’élévation, et comment les tourelles changent de forme. Et pensez-y, car si vous voulez bien bâtir à grands contre-forts, il vous faut choisir ceux qui aient assez de saillie. Prenez garde à votre affaire, et vous ferez ce qu’homme sage et entendu doit faire.”

“*I have been in many countries, as you may see by this book, but in no place have I seen a tower equal to that of Laon. Here is the plan of the first floor (le premier esligement<sup>s</sup>), with the first windows. At this level the tower has eight edges (arestes, or arrises). The four turrets (literally the ‘little children of the tower,’ ‘les iii. filloles’<sup>h</sup>) are square, on triple columns.*

<sup>s</sup> That *esligement* is “plan,” is shewn by pl. 28, where the plan of St. Etienne at Meaux is labelled, “vesei lesligement de le glize de miax.” It is our “legement.” The tower is supposed to begin, not from the ground, but from the parapet of the west front. Accordingly the first story is the first that rises above the roof of the church, but the plan actually given is that of what we should call the “first floor,”

and the description commences from that level, omitting the first or lower story, which is, however, shewn in the perspective sketch of pl. 17.—(W.)

<sup>h</sup> M. Quieherat remarks upon this technical word *filloles*, that it must have been in general use, for the inhabitants of Coutances to this day call the little towers *fillettes* which project from the great ones in the front of their cathedral. (*Revue*, p. 183.)—(W.)

Next come small arches (arket), and entablatures or 'tablements' (entaulemens), and turrets (filloles), borne by eight columns, and between two of the columns a bull's head projects. Next come arches and tablements (arket et entaulemens), and over all a roof of eight crests<sup>h</sup>. In each space or face is an arched opening (arkière<sup>i</sup>) to light the interior. Look forward and you will see the arrangement and all the elevation (tote le montée), and how the turrets (filloles) change their forms (i. e. from square to octagon as they rise). Meditate upon these, for if you desire to build such great angle-towers (or buttress-towers), you must choose a form of sufficient projection. Proceed carefully, and you will do as a wise and skilful man ought to do<sup>j</sup>."

Wilars de Honcourt has given the highest possible proof of his admiration for the towers of Laon by the careful studies he has made from them, probably to serve as a guide in his future practice. But these studies are limited to a plan and a perspective drawing without any indication of actual dimensions. He was a perfect master of the style which was practised in his own time, and which was in course of development in various examples around him: he himself also, in all probability, assisted in this development. He therefore had no need of the copious details and measurements which we require who have to identify ourselves with the forms and dimensions of a lost style that we wish to restore.

For him the general arrangements of the plan and elevation were sufficient, for he could trust to his own experience to supply the details and dimensions whenever in his practice an occasion might arise to make such working drawings as those which have been discovered in the vellum manuscript at Strasbourg, or graven on the slabs of Limoges<sup>k</sup>.

<sup>h</sup> Crestes might be thought at first sight to be a misreading for *arestes*, which has been used just before in describing an octagon, but I can bear testimony that the initial letter of the word is distinctly written c. These crests are the liues of crockets which garnish the angles of the spires.—(W.)

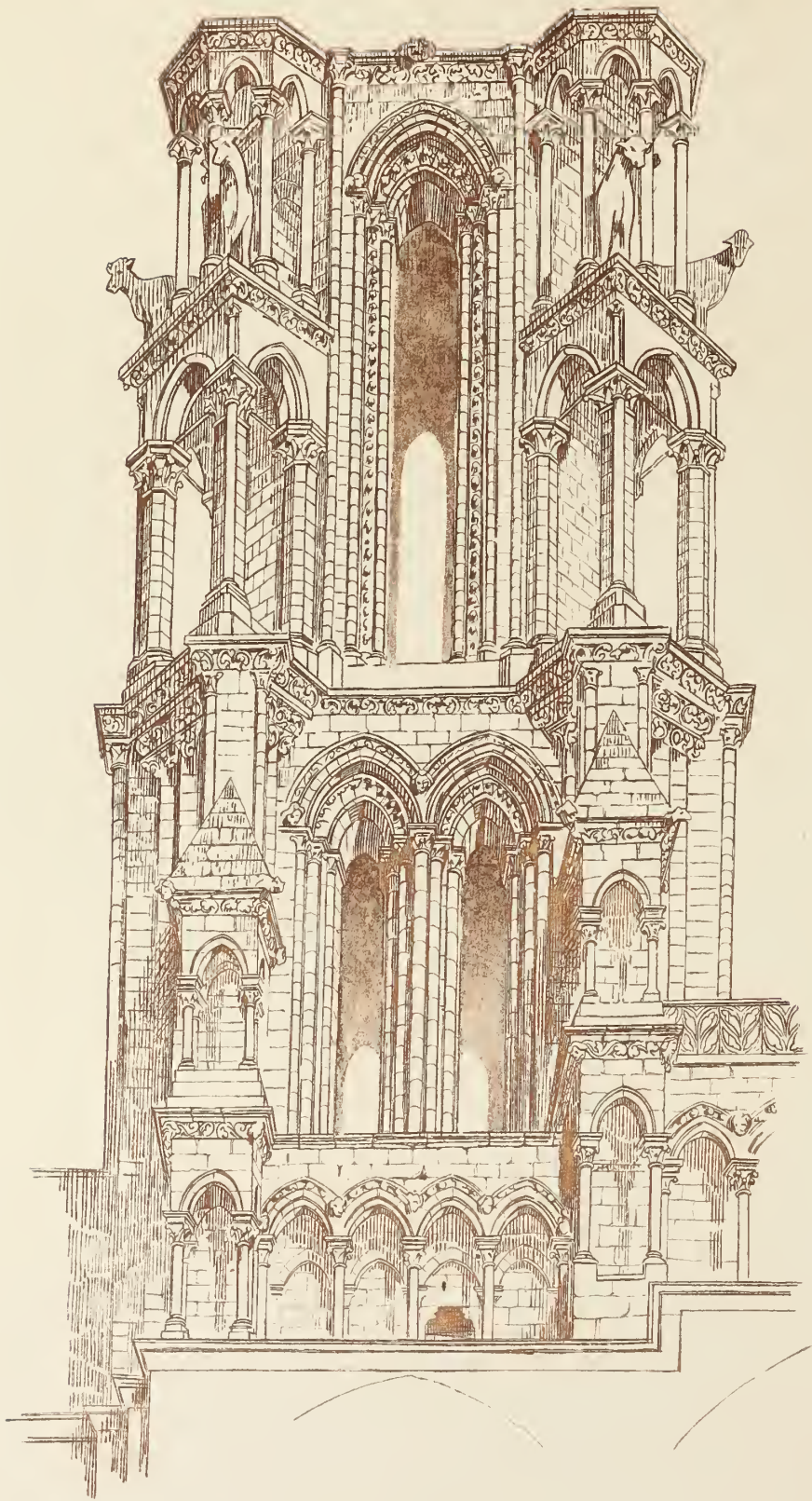
<sup>i</sup> *Meurtrière*, or loophole, according to the translation of MM. Quicherat and Lassus.

<sup>j</sup> M. Quicherat candidly declares that he does not understand the phrase, "vus covient avoir qui asés aient col." M. Lassus translates it "il vous faut choisir ceux qui aient assez de *saillie*," without alluding to the difficulty. I have merely completed the sentence by translating from the latter for want of a better guess at the meaning.

<sup>k</sup> M. Lassus here alludes to some curious working drawings of the middle ages which are described in the *Annales Archéologiques*, but as they are not so familiarly known to English as to French antiquaries, it may be well to describe them succinctly.

In 1838, Lassus and Didron discovered in a vellum manuscript belonging to the chapter of Rheims Cathedral, traces of certain architectural drawings of the thirteenth century, which had been obliterated in the same century to make way for the writing of an obituary of the members of the chapter. A closer examination led them to conclude that the eighteen pages of which the volume consisted had been procured by cutting up several long sheets of vellum which had been originally employed for architectural drawings, and contained sections, elevations, and details of some proposed buildings. The cost of parchment was sufficient to tempt the sacrifice of these drawings when they were no longer useful. One or two of these, which Lassus carefully traced and put together, are engraved, on a scale of about half the original, in the 5th volume of the "Annals," pp. 87, 94, and vol. vi. p. 139, under the denomination of Palimpsest Drawings of the Thirteenth Century. They are real working drawings of the driest description, very exactly laid

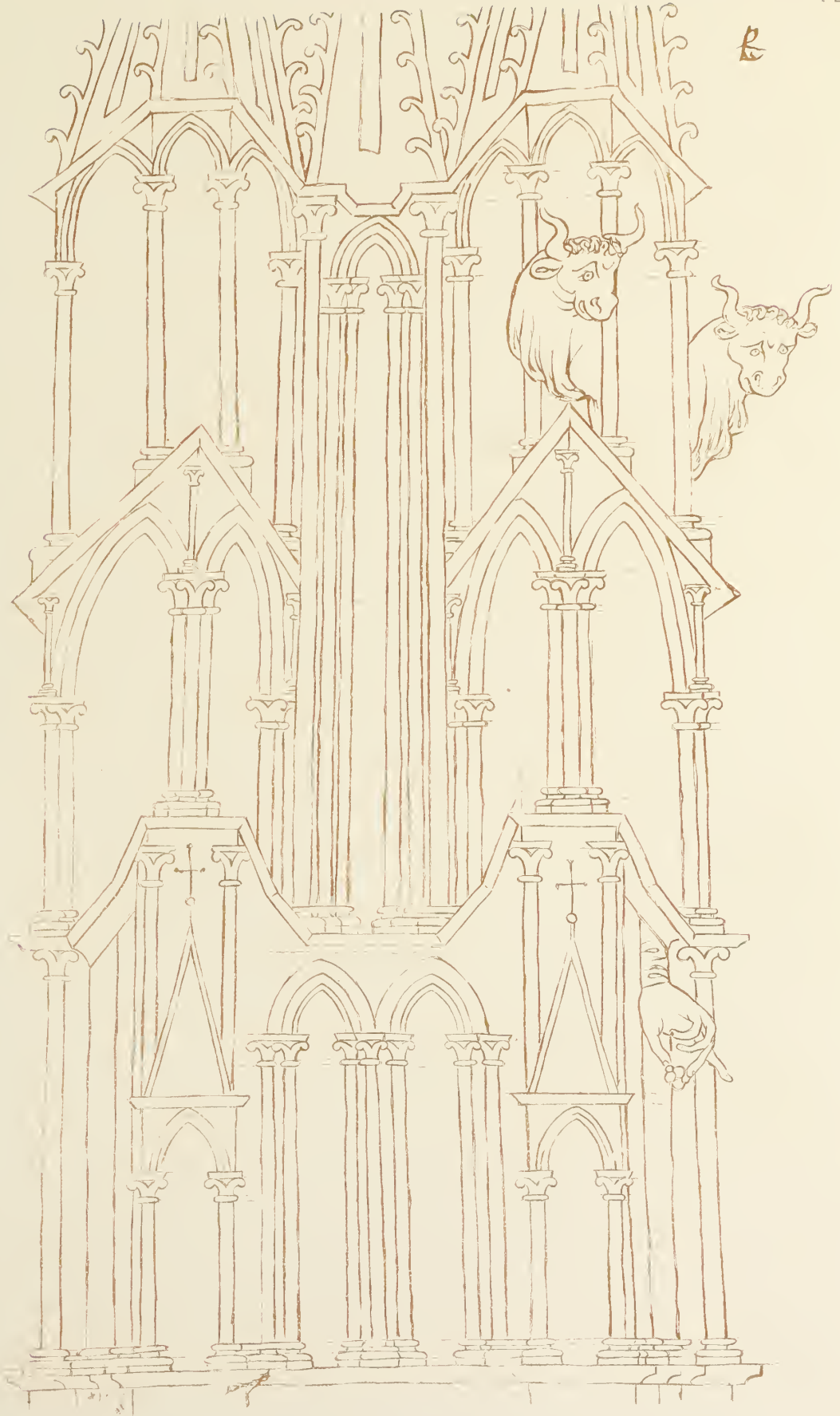




NOTRE-DAME DE LAON:

TOUR DU NORD

B





Our architect's drawings must therefore be considered as mere memorial sketches, and not such as he would have employed as designs for actual construction. To suppose that such a style would have been used for the latter purpose would be to ignore not only the examples of mediæval working drawings that have been discovered and published, but also the most elementary notions of the art of building. Those persons only who are persuaded that the cathedrals of the middle ages are the results of chance and ignorance can believe that they were erected solely from such drawings as are found in this manuscript.

There are considerable differences between the plan and drawing given by Wilars de Honecort, and those which have been carefully drawn from the existing tower, and engraved for this work<sup>1</sup>. In the first, or lower story, the difference principally consists in the greater altitude given by Wilars to the arcades and roofs of the little square structures which are applied against the faces of the buttresses, and in the smaller number of columns given to the jambs of the loop windows of the tower. The ancient drawing shews two, and the modern drawing three, shafts in each jamb. A huge hand, pointing downward and holding a cinque-foil between thumb and second finger, is shewn in the early drawing, but has no existence in the actual building, neither has the present superintending architect, M. Boeswilwald, been able to discover the slightest trace of it. In the second story, Wilars shews in his elevation two columns (as now in reality) in each jamb of the central lancet-window, but he puts three in his plan. He also has drawn the window much too narrow. The additional column may have been subsequently carved into the line of crockets which now occupies its place.

The arches of the angle turrets actually rest on octagon pillars, with a

down to scale, but containing the fewest possible lines, and when several parts occur which are alike, only one of them is drawn in detail.

One of these drawings is the west front of a cathedral having great analogy with those of Amiens and Rheims, but not exactly resembling either of them. Many architectural drawings of the middle ages were known before this discovery, but they all belong to the fifteenth century or later. These are of the beginning of the thirteenth century.

The side-aisles of the cathedral of Limoges, like those of many other French cathedrals, are roofed, not with slate or lead, but with large slabs of stone. Upon the surface of these the original masons traced their working drawings, the remains of which are still to be seen, although much effaced by the feet of visitors or workmen in subsequent ages. Copies of

some of the drawings on a reduced scale are given in the *Annales Archéologiques*, vol. vi. p. 140. They are pure working diagrams belonging each to some detached part of the edifice that happened to be in course of construction, and with which most of them can be still identified. Thus there are plans of piers, an elevation of a flying buttress, the skeleton drawing of a window, the arch-lines of the vault-ribs, and so on, and in date extend from the end of the thirteenth century to that of the fifteenth. Similar traces have been observed at Clermont and Narbonne.—(W.)

<sup>1</sup> Plates 65, 66. It has been already remarked that in his perspective sketch Wilars has shewn the lower story of the tower, but has omitted all reference to it in his descriptive note. The modern view inserts in addition the gallery of the upper part of the façade of the cathedral beneath the lower story of the tower.—(W.)

single slender shaft attached angle-wise, as the modern plan shews. But in Wilars' drawings each of these angles is supported by a group of three columns. It is possible that the octagon pillar may have been a subsequent substitution for the latter, and rendered necessary for the purpose of giving more solidity to the turrets, which really perform the office of buttresses. The octagon story of the turrets agrees with the present building, but the bulls (which still remain) are made too large in the ancient drawing.

Two traditions exist concerning the meaning of these bulls, but one of them has the double support of a chronicled text and a miracle. According to Guibert de Nogent, who enters largely into the history of this building, it happened that on a certain day one of the bulls employed to draw the building materials up the hill of Laon, fell down from weariness, when another bull made his appearance, put himself under the yoke, and having drawn the load to its destination, vanished. But the tradition of the country says that bulls were employed to raise the materials even to the top of the towers, by mounting inclined planes constructed for that purpose. The sculptured bulls are therefore either memorials of the miraculous bull, or of the employment of bulls to help the masons<sup>m</sup>.

The ancient drawing has preserved a valuable indication of the details of the spires, as well of the central tower as of its angle turrets. It shews that they all had crockets on the angles and pierced lights on the faces. The last of these spires, leaning towards the west from the effects of an earthquake in 1691, was still in existence at the beginning of the present century upon the south tower of the western front.

The greatest objects of admiration which Wilars found in these towers were the buttresses, for he advises all constructors to study these "grans pilers forkies." Unfortunately, their weight rested on the haunches of the vaults of the nave, so as to compel the addition of various works of consolidation of great expense, but which have now been happily completed.

Bamberg, Lausanne, and Naubourg have in their towers features which recal those of Laon, and Wilars may be imagined to have had some share in their con-

<sup>m</sup> The employment of inclined planes to raise materials in the middle ages is shewn in miniatures nearly cotemporary with the construction of Laon Cathedral. The raising of them from hand to hand is figured in the tenth century, in the Saxon MS. Cott. Claudius, B. iv. (Strutt's *Horde*, pl. 6); but could only be used for limited altitudes and stones of small dimensions.

The common windlass with pulleys, and a crane, are shewn in a drawing of the thirteenth century, in Strutt's *Horde*, pl. 65, from the "Lives of the Offas." MS. Cott. Nero, D. i. Vide also the sixth vol. of the *Annales*, p. 336. Our author gives a drawing of a screw for raising weights in pl. 43.



struction. But the towers of Rheims and of Strasbourg have similar resemblances to Laon, and those of the three first quoted may with more probability be cited to shew the influence of French architecture in Germany than the works of our architect. M. Alfred Ramé has pointed out <sup>n</sup> all the characteristic features of Lausanne Cathedral that appear derivable from that of Laon, amongst others the open-work buttresses at the angles of the tower, the alternation of strong and weak piers in the nave, the lantern over the crossing, and the lateral towers in two stories built against the transepts, so as to furnish them with an upper chapel at the level of the triforium gallery. In our remarks on the rose-window of Lausanne (pl. 30, below), we shall examine Wilars de Honecort's title to the architecture of this church.

The cathedral of Naubourg-sur-Saale, in Saxony, partly rebuilt between 1240 and 1250, approaches the French style. Its north-west tower is raised on a square base, and is flanked by octagon turrets, whose lower story, of the thirteenth century, recalls the tower of Laon. The upper stories have the same arrangement, but belong to the fifteenth century.

At the lower corner of plate 17 is a sketch of a tabernacle, formed by a trefoiled arch on two columns, surmounted by a square entablature, which is crowned by a central octagonal spire with smaller spires at the angles. A little star-shaped mark <sup>o</sup> may be a reference to one of the lost drawings of our MS. The style of this tabernacle is posterior to Laon, and resembles rather the upper termination of the pinnacled buttresses of Rheims Cathedral, which shelter the statues of angels <sup>p</sup>.

The bearded head, with hair in disorder, ragged cap, and raised eyes, may have been sketched from some beggar who happened to catch Wilars' attention as he was hovering, pencil in hand, around the cathedral of Laon.—(L.)

<sup>n</sup> In his *Notes d'un Voyage en Suisse*, extracted from the *Annales Archéologiques*, t. 6, p. 49. 1856.

<sup>o</sup> A pentagram.—(W.)

<sup>p</sup> Vide pl. 63. In the real cathedral the taber-

nacles in question resemble the sketch in pl. 17 more than they do that of pl. 63, as will be shewn in describing that plate.—(W.)







Veleci une des foiz mes derans  
 tele espales de le nef telez com  
 eles sunt entre .13. piles.  
 J'avoie mandel en le terre de  
 l'ongre quant io le portais  
 porco l'amau io meex.

## PLATE XIX.

## VERSO OF THE TENTH LEAF.

“Vesci une des formes de Rains des espases de le nef teles com eles sunt entre .ij. pilers. Jestoie mandes en le terre de Hongrie qant io le portrais por co lamai io miex.”

“Voici une des fenêtres de Reims, des travées de la nef, comme elles sont entre deux piliers. J'étais mandé dans la terre de Hongrie quand je la dessinai, parce que je la préférais.”

“*This is one of the windows of Rheims, like those which stand between the piers in the severies of the nave. When I drew this I was under orders to go to the land of Hungary, and therefore I like it all the better*.”<sup>a</sup>

We have already discussed this text so fully in the introductory chapter, that it is unnecessary to add any remarks concerning the journey to Hungary. This window of the side-aisles of the Cathedral of Rheims may well have pleased our architect by its proportions and its tracery, particularly if he had just arrived from Laon, where the windows are all of them simple. In this sketch, unfinished, but drawn with a firm hand, he has been content to indicate the upper part of the window which interested him, and merely the base and section of the centre mullion, being unwilling or unable to spare time in drawing the jambs. He has made the mistake of placing the capitals of the vault-ribs at the same level as those of the tracery of the window, they are actually two courses, that is to say, about three feet, below the latter.

The upper part of the plate is occupied by a half-length drawing of the Virgin, holding in her left hand a foliated stem which springs from a little ball; her right arm supports the infant Jesus, who, with His back to the spectator, is turning suddenly round; His right hand is raised in the attitude of benediction. This Virgin appears to have been copied rather from painting than from sculpture, and is derived perhaps from Rheims, where traces of ancient painting are still to be seen in the muniment-room.—(L.)

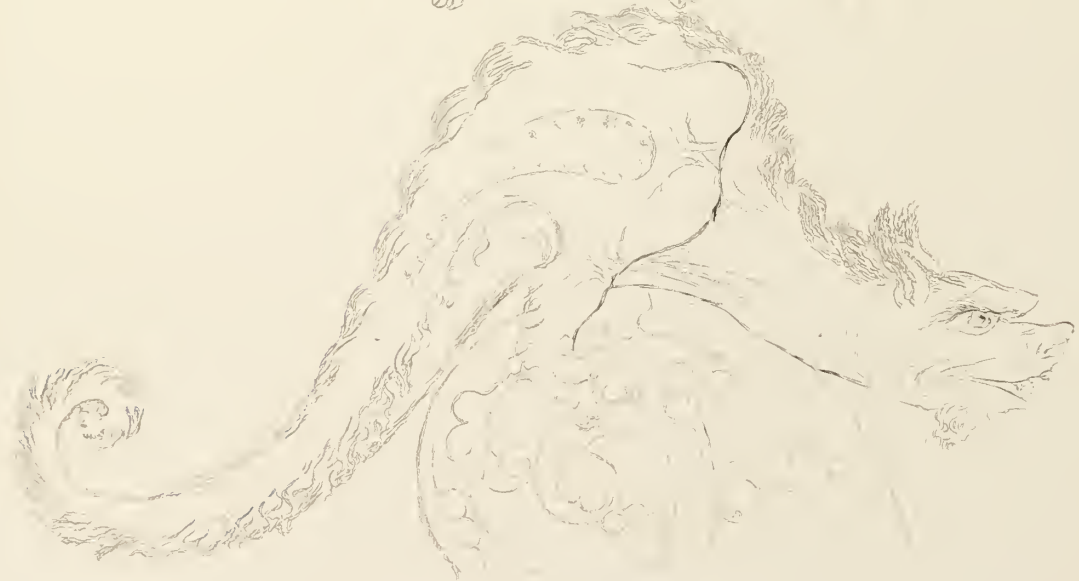
<sup>a</sup> We may presume that he was in the act of making the sketch when the message reached him, and thus connected this window with one of the pleasant events of his life. The vault-shafts shew that the

sketch was made from the interior, and the springings of the neighbouring windows are slightly indicated on each side. Vide the description of the plates 59—63 below.—(W.)





10. 6.





## PLATE XX.

RECTO OF THE ELEVENTH LEAF, MARKED IN THE FIFTEENTH CENTURY  
WITH THE LETTER *l*.

BETWEEN this leaf and the preceding one there is a hiatus of three leaves, consequently of six pages, abstracted before the fifteenth century; the slips of these missing leaves still remain, on one of them may be seen a fragment of drawing shewing a wing and a claw.

---

Christ seated, holding in His left hand the book of the Gospels, which rests on His lap, and giving a blessing after the Latin manner with the right hand; the head, although slightly sketched, is a magnificent drawing, full of science, style, and grandeur. The folds of the robe and mantle, full, and, as it were, blown about by the wind, seem particularly suitable for a painting. The energetic dragon, placed below, rests on a volute ornamented with foliage-work, which connects the turns of the spiral, as if the thing represented were a piece of metal-work, perhaps a bishop's crozier. But in none of those that we are acquainted with have we found the symbolical dragon thus placed with regard to the volute, although it sometimes makes part of the composition. The figure of the Christ and that of the dragon appear to have no connection with each other.—(L.)







## PLATE XXI.

## VERSO OF THE ELEVENTH LEAF.

THIS drawing, the only one in the manuscript which is shaded in bistre, represents an enigmatical subject, relating to some scene of antiquity unknown to us. The draped statue crowned and sceptred, seated in a sort of curtained niche, behind a quadrangular cippus, may possibly represent Jupiter above the altar of the household lares. To our knowledge, antiquity furnishes nothing analogous to the personage with short curling hair, whose shoulders alone are covered with a narrow drapery thrown over the right arm, and who, holding a vase in his right hand, raises the left, and points upwards with the first finger.

In this study of the nude we may object to the excessive projection of the hip and its depressed position, as well as to the awkward drawing of the knees; but it is impossible to deny to it a certain amount of anatomical science. Beauty in corporeal forms was not especially sought for by the artists of the middle ages: the objects of their particular studies in the nude figures, of which this sketch-book shews us so many examples, were the general form and the relative positions of the articulations, from which the draperies of clothed figures derive their relief and motion. The latter they have treated with a talent equal to that of Greek or Latin antiquity, without ever forgetting that their statuary, being intended exclusively to decorate the edifices to which they belong, ought to share in the severity of their architectural outlines.—(L.)





P<sup>re</sup> m<sup>oy</sup>

Veici l'une des .ii. damoiseles  
de q<sup>el</sup> li iugemens fu fait devant  
salemoun de leur enfant. q<sup>el</sup> cas  
ne uoloit arrot



## PLATE XXII.

RECTO OF THE TWELFTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE  
LETTER *m*.

“ ‘Vesci lune des .ij. damoizieles de qui li iugemens fu fais devant Salemon de leur enfant que cascade voloit avoir.’ ”

“Voici l'une des deux demoiselles dont le jugement eut lieu devant Salomon, à propos de l'enfant que chacune voulait avoir.”

*“This is one of the two damsels for whom Solomon gave judgment, concerning the infant they each claimed.”*

This original inscription dispenses with the necessity of further explanation. The figure, rather elongated, clothed in a long robe with many folds, seems to have been a study for a painted window. The sweetness of the countenance, the arrangement of the hair, and the individual character of the head, lead to the conclusion that we have before us a sketch made partly from nature and partly from imagination.—(L.)







## PLATE XXIII.

## VERSO OF THE TWELFTH LEAF.

Do the three figures which occupy this page belong to the composition of which the female in the preceding page is a part? May we look for King Solomon in the personage who is seated, clothed in robe and mantle of ermine, and who, one leg resting on the other, is about to draw his sword from the scabbard, as if he himself were preparing to settle the dispute that brought the two damsels into his presence?

The mitred bishop clothed in alb and tunic, and covered by the chasuble with flexible folds, may represent a priest of the Law admiring the wisdom of Solomon, for the similarity of the Jewish priests to the bishops of Catholicism is frequent in the representations of the twelfth and thirteenth centuries.

The third personage, with a kind of crown on his head, may be one of the three Magi pointing to the star that leads him and his companions to the manger.—(L.)









## PLATE XXIV.

RECTO OF THE THIRTEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY  
WITH THE LETTER *z*.

THE preceding leaf, which was the tenth of the second quire, was taken out before the literal paging of the fifteenth century was added.

THE subject which occupies this page, in which the groups are carefully balanced with all possible symmetry, was certainly composed for a painting, for statuary at this period avoided as much as possible the confusion produced by persons covering each other. M. J. Quicherat conjectures the group to represent St. Paul pleading before King Agrippa; but we are compelled to dissent from this interpretation, because the kneeling personage apparently wears a shoe on the only visible foot. Wilars never omits the characteristic of naked feet when he represents the Saviour or the Apostles, although he freely dispenses with the nimbus in his sketches of sacred figures. The subject may be Nathan reproving David, or, more probably, the Magi before Herod. It will be remarked that the three persons on the right, to whom we give this attribution, are, the one old, with a long beard, the other of mature age, with a shorter beard, and the third still young and beardless, and it is thus that they are always delineated.

THE three persons to the left represent the court of Herod. The first is clothed in a robe with tight sleeves, having another shorter dress over it, without sleeves, which is the upper robe worn in the thirteenth century; whilst the costumes of the other personages are more or less fanciful, and as it were a transformed recollection of the antique. Amongst other peculiarities we may point out the triangular fibula which clasps Herod's tunic, and the circular ones on the tunics of the youngest Magus, and of the young man in the left group, also the circular fibulæ which fasten on the left shoulder the mantle of the same Magus, and on the right shoulder the mantle of the old man with the long hair and beard, who carries a rod and wears half-boots open in the front. We have dwelt the more on these details because Willemin has advanced a rule on the mode of fastening the mantle amongst the Franks which these facts contradict. In point of fact, in this plate we find mantles clasped on either shoulder or on both.

THE beautiful drapery of these figures, whose vestments fall into so many

folds and of so peculiar a form, and the fierce character of their heads, tend to place Wilars de Honecort as an artist in the ancient German and Rhenish school, which is generally less simple in its arrangements than the French school, and this would accord very well with his peregrinations.

A resemblance may be observed between the profile of the youngest of the Magi and that of the young damsel in the Judgment of Solomon<sup>r</sup>, whose feminine outline is so completely concealed by her robe. If the same masculine model served for both, it would follow that these sketches were made by Wilars de Honecort from nature, and were not studies taken from existing works.—(L.)

<sup>r</sup> I confess my inability to discover the resemblance suggested —(W.)





## PLATE XXV.

## VERSO OF THE THIRTEENTH LEAF.

Two different compositions occupy this page, but are turned in different directions.

The lower part is occupied by two of the evangelical symbols, each winged and holding a scroll; namely, the lion of St. Mark and the bull of St. Luke, in the relative position they generally occupy when accompanying the figure of Christ in His glory giving His blessing. Perhaps the man and the eagle, which characterize St. Matthew and St. John, were on the corresponding leaf with this (the second of the second quire<sup>s</sup>), which has been abstracted. The figure of the Saviour in Plate 20, and particularly that in Plate 31, may be considered as appertaining to the two energetic studies of the lion and bull that we are now examining.

Turning the plate the other way, we recognise the subject of the Descent from the Cross, one very rarely represented in the middle ages. Here we contemplate beyond a doubt a design for a painting, composed with that peculiar skill in the equilibrium of the masses that we have already pointed out in several cases. The Virgin has grasped the right hand of Christ, which is already detached from the cross, and is kissing its wound. Nicodemus receives and supports the body in a linen cloth, while a man mounted on a ladder is occupied in drawing out with pincers the nail that still retains the left hand. Another man is pulling out the single nail that fixes the two feet, whilst Joseph of Arimathea receives the blood which may still flow from the wounds in a chalice, the "saint-graal" of legendary lore. Finally, St. John is standing to the right, and mourns over this spectacle, his head leaning on one hand, in the posture consecrated by tradition. The faces are only indicated by their contours, with the exception of the Saviour's, and everything denotes a sketch traced by a masterly and experienced hand.—(L.)

<sup>s</sup> Vide p. 16, above.









## PLATE XXVI.

RECTO OF THE FOURTEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH  
THE LETTER O.

THIS plate was published by Willemin, who modernized the heads, but scrupulously maintained the character of the remainder of the drawing. It seems to represent either Youth, or the month of May, generally figured by a young man and a young girl galloping over the fresh springing fields.

Here the young man, seated on the same bench with his beloved, seems to invite her to go and give flight to the "gentle falcon" he holds on his gloved hand.

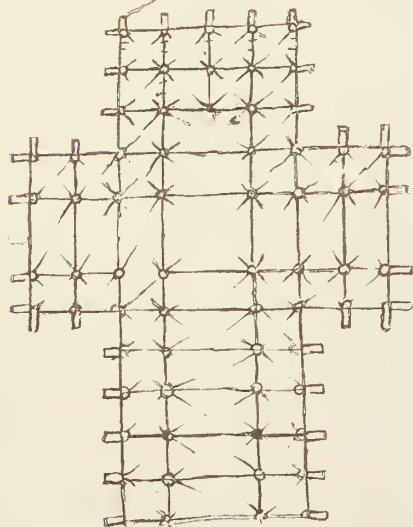
But the attitude of the lady and her sullen countenance appear to indicate displeasure. In the basso-relievos of the central door of Notre-Dame at Paris, Anger is symbolised by a young girl seated like this one, who is spurning with her foot the chest of a man kneeling before her, who was holding something, perhaps a falcon, on his hand, which is now mutilated.

The costume of the young man in our manuscript is composed of a cap of "orfroi," or gold embroidery, figured by a simple circle which binds his head. He wears the "bliaut," or blouse, fastened at the waist by a belt, and over this a mantle with furred collar. The lady is clothed in a "cotte," or tunic, a surcote without sleeves, and a mantle. Her head-dress seems to be composed of a coronet-like bonnet of orfroi, a silken net confining the hair, and a coif passed under the chin, but leaving the face and throat completely uncovered †.—(L.)

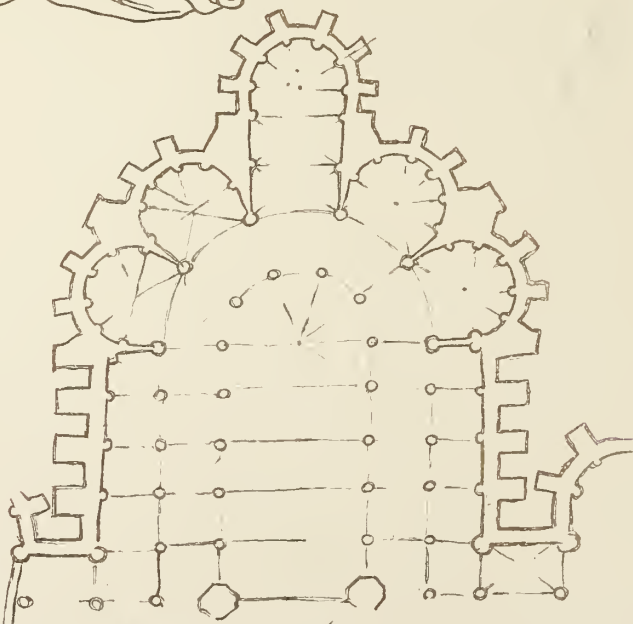
† Above the figures are the points of the lances that belong to the cavaliers of Plate 15, and they are placed so low in position with respect to the seated figures as to shew that either the two subjects were drawn before the book was stitched, or at least the previous one.—(W.)







Voici une grille de fer qui fut  
 esgardee a faire en lordene de scotland



Voici tel ligement de l'hauec me dame  
 Saunte Marie de cambrai. ainsi com il est  
 terre. auant en cest liure en trouueres les  
 montees dedens & dehors. & toute le maniere  
 des capes & des plains pans autresi. & la maniere  
 des ars boteres.

## PLATE XXVII.

## VERSO OF THE FOURTEENTH LEAF.

THE group which occupies the upper part of this page is remarkable from the fact that two wrestlers, identical with these in every respect, are carved in bas-relief on the lower panels of one of the standards, or "poupées," of the ancient stalls in the Cathedral at Lausanne, a work of the thirteenth century. This curious coincidence was observed by M. Alfred Ramé in 1856<sup>u</sup>. Coupling it with the evidence of Wilars' visit to Lausanne, which is afforded by his hasty sketch of the rose window in Plate 30, M. Ramé is nevertheless unwilling to admit that the present drawing is a sketch from the bas-relief in question. He suggests that the carver and the French architect have independently represented a scene common in Switzerland, where athletic games have been practised from time immemorial, and even to this day, as he informs us, wrestling matches are frequent; the most celebrated being those of Wengergalp, Meyringen, and l'Entibuch, which are held yearly at intervals of a fortnight, from the latter part of June to the end of September. On the whole, M. Ramé, disgusted with the rough and barbarous execution of the carving of these stalls, cannot bring himself to believe that the travelled architect of the thirteenth century would condescend to copy so miserable a representation when he had the real scene before his eyes.

Yet is it not more probable that Wilars, wishing to carry away from Switzerland a memorial of the characteristic sports of the inhabitants, was content to copy the bas-relief on account of its faithful delineation, ready to his hand, than that he should have made from nature a composition precisely identical with the carved group<sup>x</sup>?

In Plate 36 Wilars has given two other representations of wrestling. In one of them, the combatants are very nearly in the same position as those of the group now under consideration, in the other, their relative positions are different from

<sup>u</sup> *Notes d'un Voyage en Suisse, Annales Archéologiques*, t. xvi. p. 57.

<sup>x</sup> The words of M. Ramé express the most entire coincidence between the bas-relief and the drawing:—"La scène de lutteurs représente deux vigoureux gaillards, en simple caleçon, se saisissant par le milieu du corps et cherchant à se terrasser. Ce groupe m'a vivement frappé, parce qu'il se rencontre rarement dans l'iconographie chrétienne et qu'on le retrouve sans aucune modification à l'une des pages du curieux

album de Vilars de Honnecourt," &c....."Je n'oserais pas dire qu'il ait voulu conserver le souvenir d'un bas relief assez mal exécuté, comme il l'avait fait pour une rosace magnifique, mais je serais porté à croire que le sculpteur des stalles et notre architecte français, au lieu de tracer un sujet de fantaisie, n'ont fait que reproduire une scène qu'ils avaient eue l'un et l'autre sous les yeux.....Le sculpteur de Lausanne y trouvait un sujet populaire, l'architecte français un souvenir de voyage."—(p. 58.)

these; but in every one of the three groups the two figures are drawn exactly symmetrical to a vertical line in the centre, as if the one man were traced reversely from the other.



MS. of the *Roman d'Alexandre* Bodl. 264.

The annexed woodcut affords another example of the same subject, from the pages of the *Roman d'Alexandre*, in the Bodleian collection, and a fifth is found amongst the carvings of the central doorway of Notre Dame at Paris, where the vice of Drunkenness is personified by two combatants clothed in their ordinary dress, who are dealing out lusty blows after having broken their drinking-pots on each others' heads, as appears from the fragments which lie at their feet.

It may be remarked, that in Wilars' drawing the combatants are clad in mere breeches, or drawers, twisted about the waist. The one on the left wears "bas de chausses," or long stockings, which are drawn over the legs of the breeches, and secured to the girdle or waistband by means of a knotted thong or cord. The man on the right, however, has no stockings, but has tied up the ends of his breeches-legs with the cord in the same manner as the stockings of his opponent. In the Bodleian example both combatants are bare-legged, and wear their breeches twisted about the girdle like the men first described. The right-hand man has knotted up his breeches-legs to his girdle in front in a similar but neater manner than in the former example. His opponent allows that article of dress to hang freely down, and thus exhibits to us its exact cut at the lower extremities<sup>7</sup>. M. Lassus informs us that the cords by which the "bas de chausses" were secured to the girdle were termed "lie-grègues" (Anglicè, breeches-ties), and were sold by the mercers. Hence, as he says, the letter Y, assuming l'Y as a rebus for "lie," became the sign of a mercer's shop, and still continues in use for that purpose in many places, although its connection with that trade is forgotten by the public.—(W.)

"Vesci une glize desquarie ki fu esgardee a faire en l'ordene d Cistiaux."

"Voici une église carrée qui fut projetée pour l'ordre de Cîteaux."

"This is a square church which was designed for the Cistercian Order."

The Cistercian Order was founded in 1098 by monks of the Abbey of Cluny,

<sup>7</sup> These men wear about the neck a wrapper, the nature of which is illustrated by a group engraved in Strutt's "Sports," &c., (p. 75, pl. 6, from a MS. Roy. Lib. 2. B. viii.) Two men are wrestling for a cock; they are clad as in the above example, but

neither of them has tied up the ends of his breeches. Each has a long narrow shawl thrown loosely round his neck and shoulders, which his opponent grasps and strives to twist.

with the intention of carrying out more rigidly the rule of St. Benedict. Their rules, promulgated in 1134, enjoin the greatest simplicity, with absence of rich material or decoration in books and dress, and in church ornaments, whether vestments, vessels, or other utensils. Sculpture and paintings are forbidden in the churches and monastic buildings. The glass of the windows is to be white, and without crosses or pictures; the letters of inscriptions to be of one colour and not painted; the churches to be erected in places remote from the haunts of men, and all to be dedicated to the Virgin Mary<sup>z</sup>. No allusion is made to the plan or arrangements of the churches, but the simplicity and economy which are made the ruling principles of the Order would necessarily extend themselves to their architecture.

Accordingly their churches, especially those which were founded at the early part of their history, are modelled upon a much simpler plan than those of the previous Orders. This plan is cruciform, but the presbytery, or eastern limb of the cross, is square at its extremity, instead of terminating with the apse, so universal in all churches at that time. Two square-ended chapels also project from the eastern wall of each transept. The eastern aspect of a primitive Cistercian abbey presents therefore a row of five parallel square-ended chapels, of which the central one, or presbytery, is distinguished from the others by its greater projection and altitude. This description applies, for example, to all the Cistercian abbeys of England in which the primitive structure remains, and has been recognised in this country as their characteristic arrangement for several years. M. de Montalembert has also pointed out this disposition in more than a hundred and fifty abbeys of this Order. Simplicity of plan, however, soon gave way to prevailing fashion, even in this rigid Order, and the square-ended choir was in the richer establishments replaced by more elaborate constructions, as at Fountains Abbey. But the fact is, that the square end primitively adopted by the Cistercians had been already employed, at least in England, where, as is well known, the Norman apsidal termination of the east end was early abandoned. It is very difficult to determine the exact time at which square eastern terminations were introduced into England, because very few large Norman churches have retained their original chancels; for the tendency to elongate this member of the church, which began in the twelfth cen-

<sup>z</sup> The complete rule is given by Manrique, in his *Annales Cistercienses*, t. i. p. 271. The earlier rule, or *Charta Charitatis*, formed in 1119 (*ibid.*, p. 109),

has no allusion to these details. Towers of wood or stone for bells were not to be raised to an immoderate height.

tury, occasioned most of their eastern extremities to be rebuilt on a more extended plan.

Two distinct examples may, however, be quoted. (1.) The cathedral church of Old Sarum, dedicated in 1092. This was square at the east end, as the foundations shew. (2.) The cathedral of Ely. It is true that its Norman termination was pulled down when the present Early English presbytery was erected; but during the extensive works that were carried on a few years since for the refitting of the choir, an opportunity was afforded for examining the foundations of the original termination, of which I availed myself, and was enabled to establish the conclusion that the Norman foundations, originally disposed for a circular apse, had been subsequently modified to enable them to carry a square termination. Now the Ely Chronicle shews that the foundations of the church were laid by Abbot Simeon about 1082, and the works then suspended; but that Abbot Richard resumed them, and between 1100 and 1107 carried up the walls of the church of which Simeon had only commenced the foundations twenty years before. The change from round to square must, therefore, be attributed to Richard, and the latter fashion is thus placed between 1082 and 1100. The Cistercian Order was founded in 1098, six years after the building of Old Sarum Church, and its introduction into England is dated by the building of Waverley Abbey in 1128. The square-ended church at that place, of which the foundations still remain, was not commenced until 1203, and the plan of their primitive church at that place is unknown. The other square-ended Norman churches in England are either undated, or, if of known date, are subsequent to the introduction of the Cistercian Order. They are, the Cathedral of Oxford; Romsey Abbey, Hampshire; St. Cross, near Winchester (1136), and Roger's crypt at York Cathedral (1154—1181). But the cathedral churches of Old Sarum and Ely are sufficient to prove that we do not owe the square form of our English chancels to the Cistercian monks <sup>a</sup>.

<sup>a</sup> It must be observed that when Lassus was engaged upon this chapter, he took great pains to consult various antiquaries upon the point in question, and that his editor has published in the notes the principal letters which, upon this occasion, were returned in answer to his enquiries; namely, from M. Montalembert, in France; myself, and Mr. Parker of Oxford, in England; and M. Schmaase, of Berlin. I subjoin these letters, which contain several curious facts in relation to the subject. The letter which I addressed to M. Lassus upon this occasion I have given in substance in the text above, and therefore omit it here.

“MON CHER LASSUS,

“L'ordre de Cîteaux n'ayant commencé qu'en 1098, il ne saurait y avoir d'églises cisterciennes du xi<sup>e</sup> siècle. C'est au xii<sup>e</sup> seulement que remontent presque toutes leurs églises. La plus ancienne que je connaisse encore debout est celle de Pontigny (1114), puis Fontenet, près Montbard, de 1118, puis Noirlae, près Saint-Amand, en Berry, de 1136. Dans ces deux dernières, comme dans toutes les églises *primitives* de Cîteaux dont j'ai pu visiter les ruines, j'ai toujours trouvé le chevet carré. Je dis *primitives*, parce que, dans les églises reconstruites à la fin du



In the primitive Cistercian plan no chapels or lesser altars are placed to the east of the high altar. But a circular apse with its circumscribing aisle and

xii<sup>e</sup> siècle et au xiii<sup>e</sup>, on a pris l'abside polygonale. Vous pouvez aussi citer l'ancienne et très-curieuse église des SS. Vincent et Anastase, près Saint-Paul-aux-trois Fontaines, à Rome. Cette église, donnée à saint Bernard en 1140, et probablement reconstruite alors, a le chevet carré, et les quatre chapelles parallèles au chœur, comme les églises cisterciennes de France.

“Si vous faites mention de ce détail dans votre livre, permettez-moi de tenir à ce que vous y parliez de mon futur ouvrage sur les moines d'Occident, parce qu'à ce fait, *découvert* par moi, se rattachent diverses autres considérations que je n'ai pas le temps de vous expliquer.

“Agréez mille amitiés.

“CH. DE MONTALEMBERT.”

“Oxford, 9 avril 1853.

“MON CHER MONSIEUR LASSUS,

“Je vous demande mille pardons de n'avoir pas répondu plus promptement à votre dernière lettre, mais j'avais besoin de faire quelques recherches pour m'assurer si ma première impression était exacte, et le temps m'a manqué. Je me trouve tout à fait confirmé dans ma pensée par les meilleures autorités, et je n'hésite plus à dire que vous êtes dans l'erreur quand vous supposez que les premières églises et abbayes fondées en Angleterre, après la conquête, appartiennent aux religieux de l'ordre de Cîteaux. Au contraire, presque toutes les abbayes de cet ordre sont fondées dans les dix années qui séparent 1128 de 1138. Nous avons vingt-quatre grandes abbayes de cet ordre fondées à cette époque et seulement cinq après, et encore sont-elles des dépendances.

“Il me semble que les premières abbayes fondées en Angleterre après la conquête normande étaient de l'ordre de Cluny.

“Les abbayes de cet ordre commencent avec : Lewes (Sussex), 1078 ; Weulock (Shropshire), 1080 ; Bermondsey (Surrey), 1082 ; Northampton, 1084 ; Daventry (Northamptonshire), 1090 ; Castle-Aere (Norfolk), 1085 ; Pontefract (Yorkshire), 1100 ; Montacute (Somerset), 1100 ; Thetford (Norfolk), 1104 ; Lenton (Nottingham), 1108 ; Bromholm (Norfolk), 1113 ; Farleigh (Wiltshire), 1125.

“Voilà une douzaine d'abbayes de l'ordre de Cluny avant la première de l'ordre de Cîteaux.

“Si vous avez besoin d'autres renseignements, j'aurai beaucoup de plaisir à faire de mon mieux pour vous.

“Agréez l'assurance de mon estime et de mon amitié.

“J. H. PARKER.”

“Oxford, 8 mai 1853.

“MON CHER MONSIEUR LASSUS,

“La question que vous m'avez posée m'intéresse beaucoup, et j'avais pensé à vous donner une réponse suffisante après quelques petites recherches ; mais je ne trouve pas aussi facilement que je l'aurais supposé les plans gravés qui m'étaient nécessaires pour ne pas me fier exclusivement à une mémoire trompeuse, Malheureusement les plans manquent à la plupart de nos ouvrages sur ces sujets. J'ai trouvé un assez grand nombre d'églises de Cîteaux *toutes carrées*, mais je n'ai pas été aussi heureux pour celles de Cluny. Cependant je suis certain que vous avez raison en supposant qu'elles étaient en *rond-point*. Quelques-unes ont été altérées après leur construction. J'ai souvent remarqué que nos églises les plus anciennes étaient terminées circulairement primitivement, et que leur chevet avait été modifié après coup. Cela s'accorde très-bien avec l'idée que les églises de l'ordre de Cluny, plus anciennes que celles de l'ordre de Cîteaux, étaient toutes sur ce plan. Ce sujet du plan des églises appartient spécialement à mon ami le professeur Willis ; je lui ferai votre demande, et je ne doute pas qu'il ne vous donne des renseignements précis.

“Agréez l'assurance de mon amitié.

“J. H. PARKER.”

“MON CHER MONSIEUR PARKER,

“J'ai été bien vivement intéressé par la lecture de la lettre de notre ami M. le docteur Willis. Ce qu'il dit des églises antérieures à l'introduction de l'ordre de Cîteaux dans votre pays est fort curieux, et il serait bien intéressant de rechercher les motifs qui ont pu déterminer à cette époque l'emploi si général de la forme carrée pour les absides des églises. Comment expliquer en effet que le style normand, c'est-à-dire l'art roman, introduit chez vous par la conquête, affecte immédiatement, de l'autre côté du détroit, et d'une manière générale, la forme carrée, lorsque chez nous la forme circulaire est, pour ainsi dire, constante, surtout en Normandie ?

“Ainsi, en général, nos églises du xi<sup>e</sup> et du xii<sup>e</sup> siècle se terminent en abside circulaire ; seulement il s'est établi, au xii<sup>e</sup> siècle, une exception pour les églises de l'ordre de Cîteaux, qui prennent la forme carrée à leur abside. C'est vers cette époque qu'ont lieu la conquête et l'importation de l'art normand en Angle-

radiating chapels admits not only of these additional chapels, but provides a "procession path" for the ceremonials, as the above name for the circumscribing aisle, alluded to by Gervase in the thirteenth century, sufficiently proves. The same convenience can be obtained by continuing the side aisles of the eastern limb of the cross behind a square-ended chancel. But the eastern portion of this aisle is generally made of greater breadth than the lateral aisles, to allow room for placing the altars against the eastern wall. This system occurs in England in the choir which Archbishop Roger added to York Cathedral (1154—1181), as

terre, et l'on voit cette forme carrée, presque exclusivement réservée chez nous à l'ordre de Cîteaux, généralement employée chez vous, soit avant l'introduction de cet ordre en Angleterre, soit avant même sa fondation en France, comme le prouve l'église d'Old-Sarum et peut-être la cathédrale d'Ely, où la forme carrée apparaît presque en même temps que l'ordre de Cîteaux en France.

"Doit-on attribuer l'adoption de cette forme caractéristique de notre art roman à sa simplicité et à la facilité de son emploi dans les constructions, ou bien faut-il y chercher l'influence d'artistes ayant une préférence pour cette forme ?

"Je suis porté à penser, comme notre ami M. Willis, que la simplicité qu'elle présente a été la cause déterminante. En effet, chez nous, on le sent très-bien, aux xi<sup>e</sup> et xii<sup>e</sup> siècles nos constructeurs éprouvaient d'assez sérieuses difficultés dans l'exécution des absides circulaires. La construction des voûtes présente souvent dans cette partie de nos anciennes églises des hésitations et des maladresses qui prouvent que, même avec des ouvriers du pays, les constructeurs de l'œuvre se trouvaient souvent fort embarrassés. On comprend dès lors qu'arrivant dans un pays conquis pour y bâtir avec des ouvriers étrangers, ils aient pris pour modèles les monuments les plus simples de leur pays natal. De sorte que mon opinion relative à l'influence des églises de l'ordre de Cîteaux pourrait bien être juste, dans certaines limites, quoique l'introduction de cet ordre dans votre pays n'ait eu lieu que plus tard.

"Qu'en pensez-vous, mon cher Monsieur Parker ? J'aurais écrit tout cela à M. Willis si j'avais eu son adresse ; mais veuillez lui faire part de mes observations.

"LASSUS."

"Berlin, 14 juin 1853.

"Ma lettre, mon cher Monsieur, a été retardée par un hasard qui me donne l'occasion d'une question qui

se rattache encore à Villard de Honnecourt. Celui-ci donne dans son manuscrit deux dessins pour des églises de l'ordre de Cîteaux. Tous les deux ont le chœur ou la chapelle derrière le chœur de forme carrée. Cette forme se retrouve dans les églises de cet ordre en Allemagne, quoiqu'elle ne soit ni exclusive ni exécutée de la même manière. A ce qu'il me semble, c'était plutôt une coutume qui s'introduisait par imitation, qu'une règle prescrite par les lois de l'ordre.

"Les églises de l'ordre de Cîteaux, en Allemagne, dérivent (toutes ou la plupart) de Morimond, diocèse de Langres, quatrième fille de l'église mère. Est-ce que cette église existe encore, et quelle forme son chœur présente-t-il ?

"En Allemagne, ces églises ont souvent le chœur carré, mais entouré de bas-côtés et même quelquefois de chapelles tout autour. Cela dérive-t-il de Morimond ?

"Voilà, Monsieur, les questions que je présente à votre bienveillance, en vous renouvelant l'assurance de mon estime.

"SCHNAASE."

Upon this letter M. Darcel remarks that M. Schnaase, by asking whether the Church of Morimund still exists, and what was its plan ? shews that, in stating that all or most of the Cistercian churches in Germany are derived from Morimond (the fourth daughter of the mother church of Cistercium), he alludes solely to the filiation of the societies, and not to the architecture of their buildings. M. Darcel adds that the Church of Morimund is entirely destroyed, and that, moreover, the numerous and complete notes which M. de Montalembert has collected during twenty years concerning the Cistercian churches in France, England, and Germany, contain nothing in allusion to the square choir surrounded with chapels which M. Schnaase declares to be the characteristic of Cistercian churches beyond the Rhine.

shewn by the crypt, which still exists; also in the Norman choir of Romsey Abbey, and the Early English choir of Byland. The low aisles of De Lucy's work, added to the Norman east end of Winchester Cathedral in 1202, may be cited, as well as Salisbury Cathedral, the Early English low aisles at the east end of St. Saviour's Church, Southwark, and various others<sup>b</sup> in this country. The above examples are just previous to the period assigned to Honecort.

The plan which Honecort has given under the name of a square church for the Cistercians resembles these English examples, and more especially St. Saviour's Church at Southwark: the latter, however, has three transverse aisles at its eastern extremity instead of the two given by our author, and the length of the eastern arm of the cross is much greater. Enough has been said, however, to shew that this system of placing transverse aisles and altars at the east end of a square-ended church did not originate with Wilars de Honecort.

M. Lassus, evidently unacquainted with the English examples, remarks, "That he is not aware of any church in which the arrangement shewn in Honecort's plan is to be found, for the Cathedral at Laon and the English square-ended cathedrals have no gallery<sup>c</sup>, and are terminated by a plain wall. According to M. Schnaase," he continues<sup>d</sup>, "the Cistercian churches of Germany do possess the peculiar form given by Honecort. Possibly, therefore, he may have derived it from his German travels, for a German character pervades the whole of his compositions, as well of his figures as of his architecture, and seems to shew that, in addition to his recorded visits to Switzerland and Hungary, he must have studied beyond the Rhine. The Cistercians, however, did not rigorously adhere to their primitive system, for at Pontigny, founded in 1114, the Abbey church, constructed at the latter end of the twelfth century, has a circular apse, but the transept chapels follow the ancient arrangement. The radiating chapels of the apse lie quite close together, like the voussoirs of a semicircular arch, each being in plan a trapezium, so nearly square as to appear to be really so. The outer wall of the chapels is an exact and continuous semicircle, and thus the greatest possible appearance of simplicity (and economy of construction) are obtained that such an arrangement would admit of. The apse and chapels given in Plate 28, and the somewhat similar group in Plate 32, are compromises between the rigid

<sup>b</sup> The low eastern aisles at Hereford, and the eastern works at Exeter. At Fountains Abbey (Cistercian) and Durham, the vaults of the eastern additions rise as high as those of the nave.

<sup>c</sup> The meaning of M. Lassus is not quite clear. Does he mean that no transverse aisle occurs in an

English church? Yet even in our high flat eastern walls, the triforium is continued across in the thickness of the wall. His words are, "Dans les cathédrales anglaises qui présentent un chevet carré il n'y a point de galerie."

<sup>d</sup> Vide the letter in the note above.

Cistercian form and the complex system adopted by other orders. The latter was, as will appear below, actually a Cistercian church."

M. Viollet le Duc has engraved (in his Dictionary, p. 270, t. i.) an ancient bird's-eye view of the Abbey of Cîteaux, before its rebuilding at the beginning of the eighteenth century. It shews a Romanesque-looking, cruciform church; the eastern limb of the cross is no longer than the transepts, and the side-aisle roof runs on the east of the transept and the side of the presbytery, and is continued at right angles along the eastern gable. The plan of Clairvaux (*ibid.* p. 267) has an apsidal termination to the presbytery, which has a circumscribing aisle and nine square radiating chapels, like those of Pontigny described above.—(W.)

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"Vesci l'esligement del chavec medame sainte Marie de Canbrai ensi com il ist de terre. Avant en cest livre en troveres les montees dedens et dehors. et tote le maniere des capeles et des plains pans autresi. et li maniere des ars boteres."

"Voici le plan du chevet de madame sainte Marie de Cambrai, tel qu'il sort de terre. Plus avant en ce livre vous en trouverez les élévations du dedans et du dehors, ainsi que toutes les dispositions des chapelles et des murailles, et la forme des arcs-boutants."

*"This is the plan of the apse of 'Madame Saint Mary' of Cambrai, as it is now rising from the ground. Further on in this book you will find the inside and outside elevations, the arrangements of the chapels and lateral walls and of the flying buttresses."*

Much has been already said concerning this church, in order to shew that Wilars de Honecort was the architect of it. Plate 67 gives the plan of the Cathedral of Cambrai<sup>e</sup>, taken upon occasion of its demolition in 1796, when its materials were sold as national property at the Revolution. With due allowance for the omission of minor details, Honecort's plan will be found to correspond exactly with this. The principal details omitted by him are as follows:—The south wall of the apse is inflected from its proper direction at its junction with

<sup>e</sup> This plan was drawn by M. S. M. Boileux, architect of the town of Cambrai, and given in 1827 by his son, who succeeded him, to M. de Baralle, diocesan architect of the department "du Nord;" the latter transmitted it to M. Lassus. The plan appears to have been made from the building while yet standing, at least to a considerable height above the ground, for it shews the windows of the lower story, and the interior gallery which is at the level of their sills, (*vide* Plate 59). Another plan in the possession

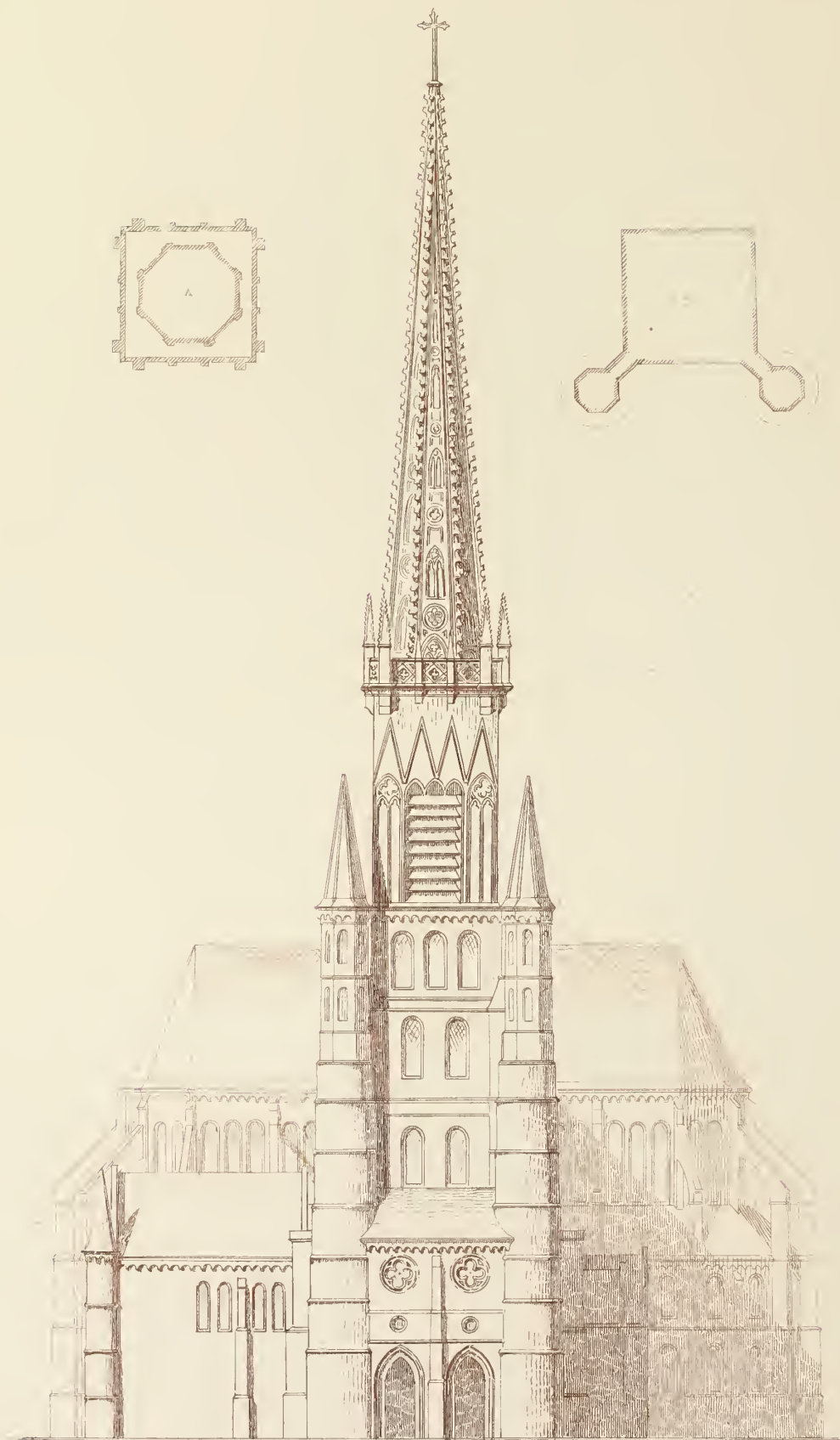
of M. de Baralle, which bears the official signature of the Sieur Des Anges, the secretary of Fénelon, shews the mutilations which the choir of Notre Dame at Cambrai suffered under that illustrious prelate. It indicates the works of marble, joinery, and fine iron-work in the choir and transepts that were carried out in accordance with the contract made at Paris April 20, and ratified at Cambrai in full chapter May 8, 1719.—(L.)







DE CAMBRAI





the transept, to make room for a stair-turret that leads upwards to the triforium ; on the north side the similar staircase is placed at the extremity of the transept, and therefore no such deviation appears. At Rheims and at Cambrai a staircase is formed in the thickness of the wall which separates the central chapel of the apse from the first chapel to the south : also each group of vault-ribs rests on a pier which stands detached from the wall, like an interior buttress, giving greater solidity to the structure, and at the same time lightness of appearance. These details were probably added during the progress of the building, and are not to be found in Honecort's plan, which was made when the foundations only were laid.

No interior elevations of the church have been preserved, and the exterior elevations engraved in Plates 68 and 69 are derived from the small model of the cathedral which forms part of a relief-plan of the town of Cambrai made in 1695. This plan was carried off by the Prussians as a trophy, and is now at Berlin. Its scale, fifty feet to the inch, is too small to afford minute details, but the care with which the model of the church was made is sufficient to shew the general style of the different parts of the structure<sup>f</sup>.

Its nave, transepts, central tower, and western tower as high as the roof, were Romanesque of the simplest kind, (1023 to 1030, and 1068 to 1079).

The buttresses of the nave and the flying-buttresses of the transepts must have been subsequent additions to support vaults. The upper story and spire of the western tower belong to the end of the thirteenth century : this tower is flanked

<sup>f</sup> The drawings engraved in Plates 68, 69, were executed for Lassus by M. Schnaase at Berlin, who also sent him the following information on Dec. 20, 1852 :—"The relief-plan of Cambrai includes a model of the cathedral ; But this model is fixed in the middle of the plan, the diameter of which is about three metres and a-half (or twelve English feet), so that although on a tolerable scale, it is too far off to be accurately delineated." But permission having been subsequently obtained, the model was detached, and M. Schnaase wrote to assure Lassus that his drawings were accurately detailed, but that the model was on too small a scale to furnish the particulars of the moldings, the tracery of the windows, or the balustrade which encircles the roof of the choir. On the other hand, M. de Fremoire, engineer of the "chemin de fer du Nord," wrote from Stettin, Dec. 15, 1855,—"The inscription on the plan of Cambrai is 'Fait en 1695, réparé en 1773—1845 ; échelle de 6 pouces pour 50

toises.' The date of 1845 refers solely to a fresh coat of paint. The scale ( $\frac{1}{60}$ , or 50 feet to an inch English) is plainly too small to give much detail. The cathedral itself is about sixteen inches long and eight inches broad. The bells, windows, and flying buttresses are plainly shewn, but there are no architectural details. If M. Lassus gives them, the architect must have guessed at them and restored them." Comparing these two letters, and considering the assurances of precision given by M. Schnaase, the French editor Darcel concludes "that the details shewn on the drawings, which are on the same scale as the model, are exactly copied from the model, and that nothing is supplied in addition in the engravings." It may be added that these engravings are so nearly on half the scale of the model according to the rough approximate dimensions supplied by M. de Fremoire, that it may fairly be supposed that they were purposely made to that scale exactly.

by two stair-turrets in advance and almost detached from it, but which rise only to the level of the Romanesque part<sup>g</sup>; above this the staircase must have been carried up on the inside. This portion of the work is posterior to Wilars de Honecort: the works of the cathedral were carried on to the year 1472<sup>h</sup>. Cambrai is one of the few churches that has round-ended transepts; also the latter have an interior triforium gallery and a semicircular chapel in two stories attached to the east side of each transept. These arrangements, peculiar to the north of France and the banks of the Rhine, were reproduced in the thirteenth century, as already stated, in the Church of Marburg, dedicated to St. Elizabeth, who had herself, just before her death, given in 1230 liberal sums in aid of the reconstruction of the choir of Notre Dame at Cambrai.

This choir was the work of Wilars de Honecort, and the elevation in Plate 69 shews that the windows of the chapels were, like those of Rheims, divided into two-pointed lights by a central monial, and had a six-foiled circle above. The clerestory windows are on the same principle, but at Cambrai the circle is quatre-foiled, and the windows are surmounted by gablets. Pinnacles rise above the buttresses, and the balustrades of the parapets abut against them. These are not the arrangements of Rheims, and seem to have been imitated from the Sainte Chapelle at Paris. Besides, the flying buttresses are single at Cambrai, but double at Rheims, and their form as well as those of the buttresses, so undecided and inelegant, as to make it probable that they are the results of a repair in after-times. These disparities between the elevations of Cambrai and Rheims may fairly be attributed to constructions subsequent to those of Wilars de Honecort, for as the plans of the two are identical, the forms of the superstructures ought also to have been the same.—(L.)

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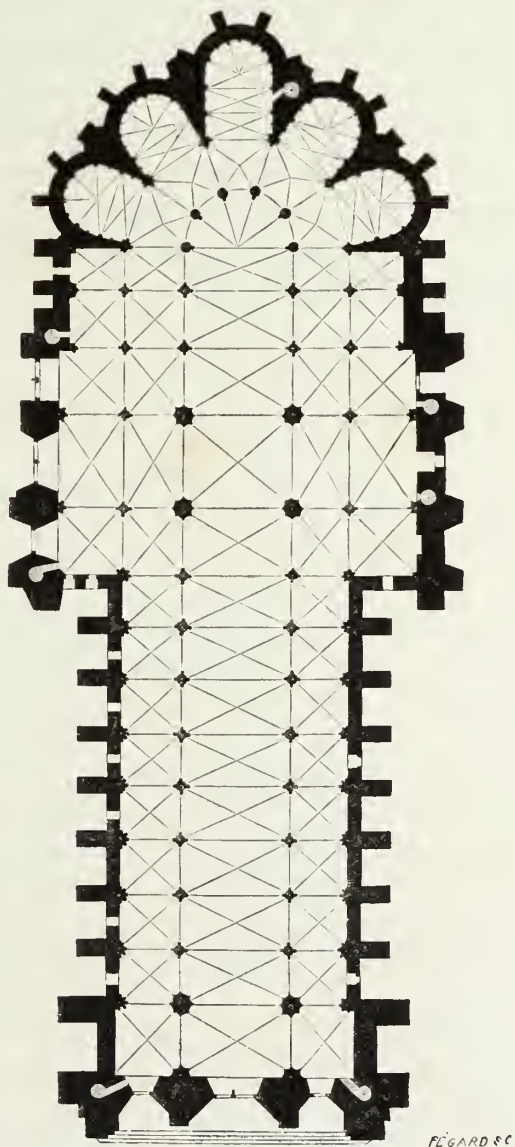
These remarks upon De Honecort's plan of the apse of Cambrai are literally translated from Lassus. His final conclusion can hardly be accepted; variations in arrangement like those described in the text might have been introduced,

^g Vide the detached plans of this tower in Pl. 68, where B shews the plan just below the floor of the upper story of the Romanesque part of the tower, and A the plan of the square part of the subsequent addition, taken above the cornice so as to shew the pinnacles that rest on the corbels. It also gives the plan of the spire.—(W.)

^h The western tower with its spire remained intact

in 1806, although it had been often struck by lightning. A report addressed to the Celtic Academy by Alexander Lenoir alludes to a project for converting it into a burial-place and monument to Fénelon; but its ruinous condition, which brought it to the ground two years later, put an end to this *bizarre* but *grandiose* project.—(A. D.)

even by Honecort himself during the progress of the work, even supposing him to have superintended it.



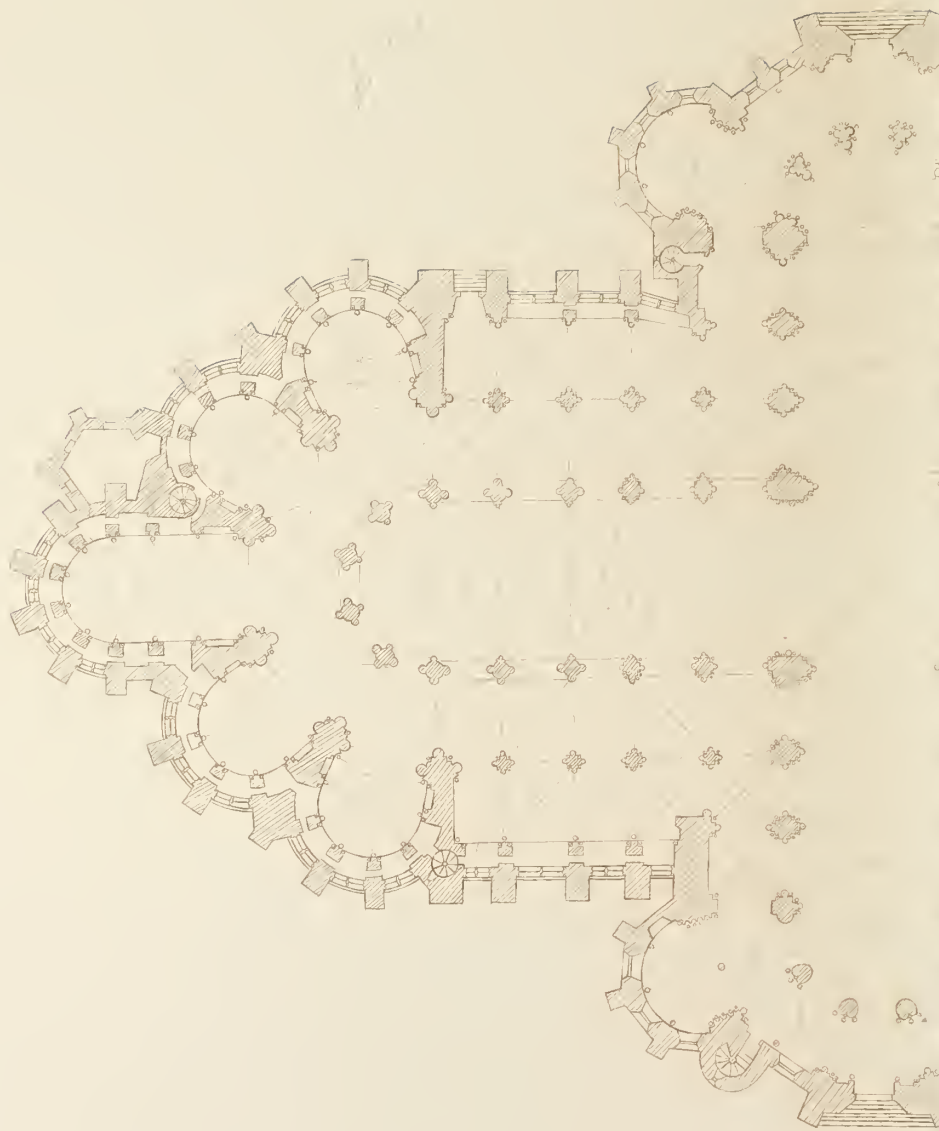
Plan of the Cathedral of Rheims.

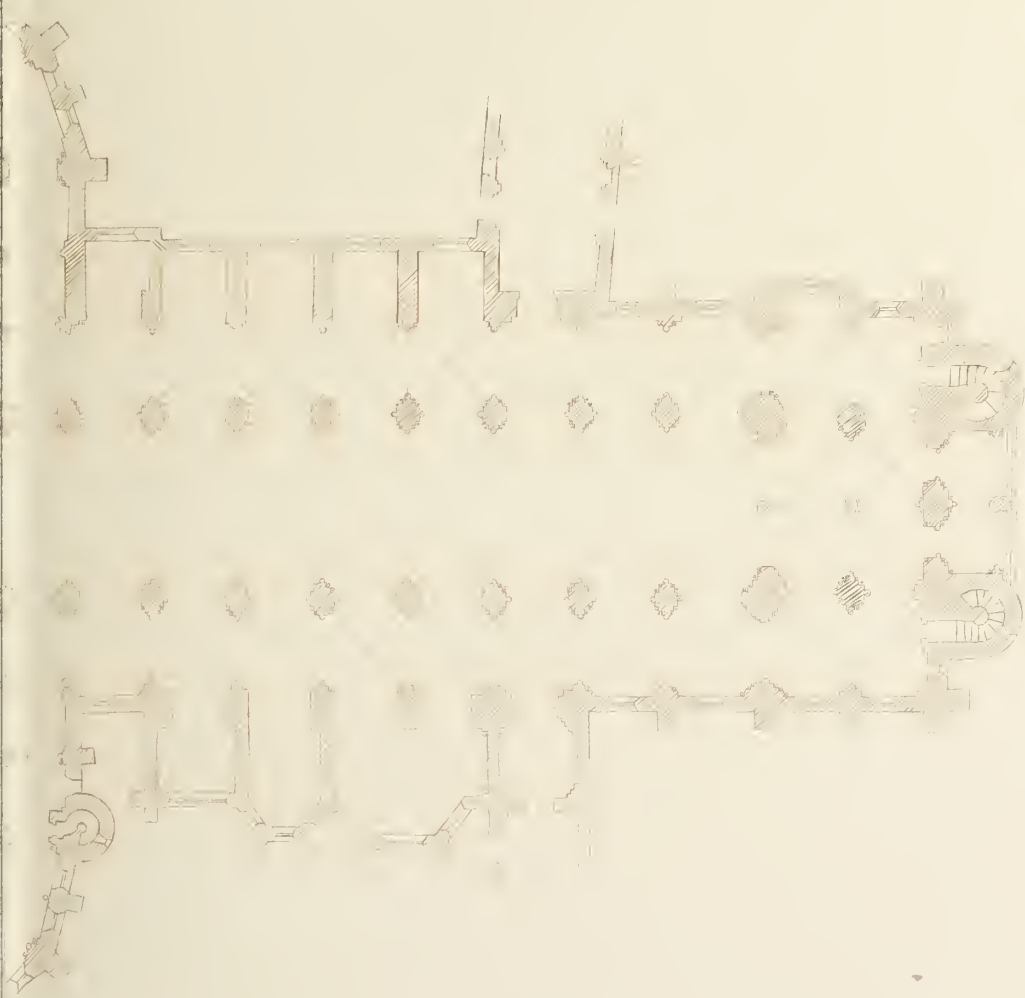
The annexed plan of Rheims Cathedral will shew the similarity between its eastern limb and that of Cambray. This plan was engraved for M. Viollet le Duc's Dictionary of Architecture, and was by him obligingly communicated to the editors of the present work. Unfortunately the vault lines of the radiating chapels are erroneously drawn, although the walls are correctly laid down. In

the plan the vaults are represented in the same manner as those of Cambray in Plate 67. The ribs from the five sides of each polygonal chapel radiate from one centre, and those of the remaining two sides next to the entrance are disposed as in an ordinary cross-ribbed vault. But in reality, the ribs from all the seven sides of the chapel radiate from a common centre, exactly as in Honecort's plan of Cambray in Plate 27, and in Honecort's plan at the lower part of Plate 28. Probably, therefore, the modern plan of Cambray is as erroneous in this respect as the woodcut we are examining. The Lady-chapel of Cambray was longer than that of Rheims by one severy, and its presbytery had five severies exclusive of the apse, whereas Rheims has but three.—(W.)

EGLISE NOTRE-DAME

DE CAMBRAI



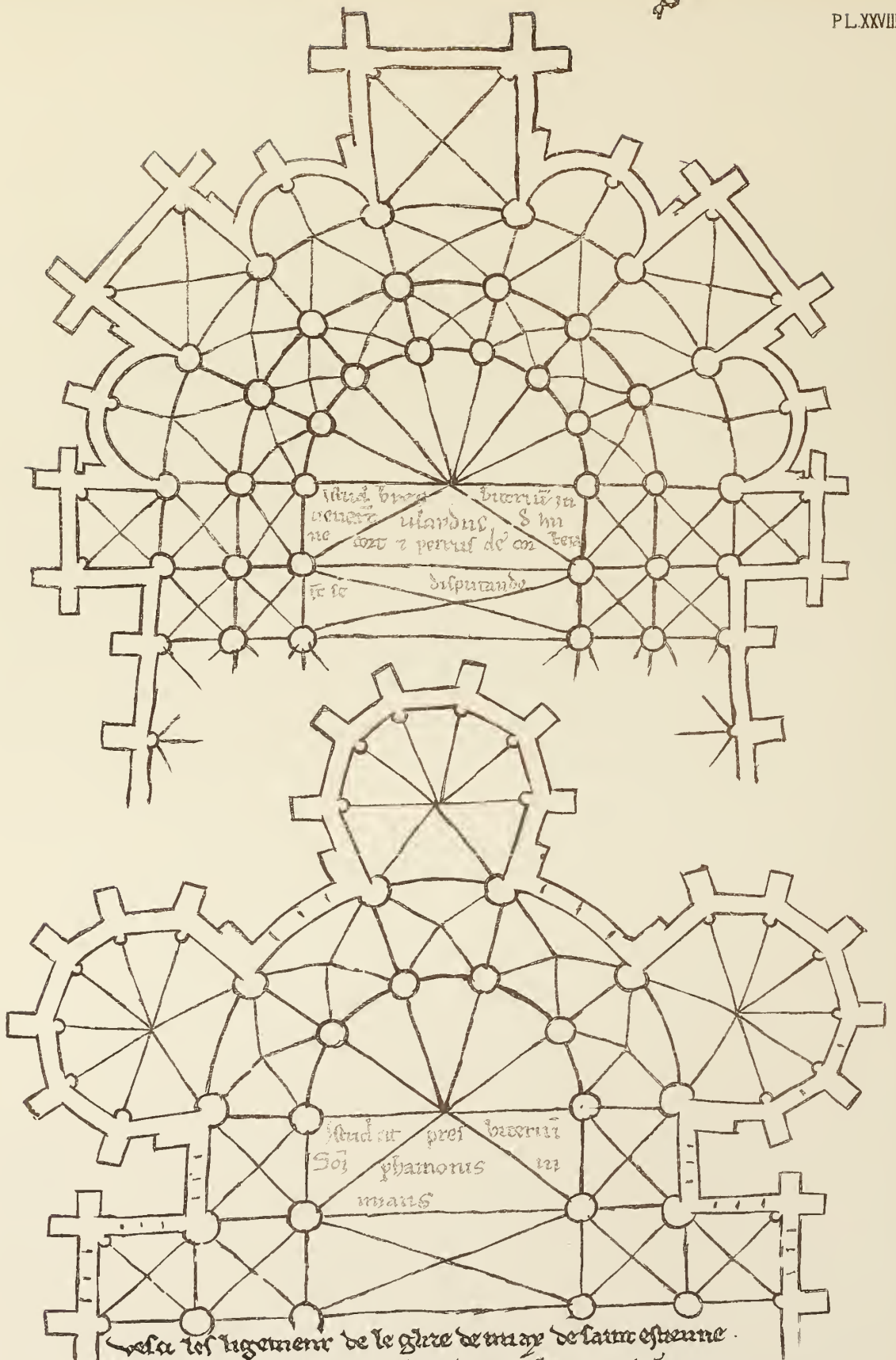


1/20000
1/10000
1/5000



30 Metres





Vela les ligement de le glize de may de saint estienne.
 De seure est une glize a double charole. Espilars de honneur et ont pie
 res de corbe.

PLATE XXVIII.

RECTO OF THE FIFTEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH
THE LETTER *p*.

This is now the first leaf of the third quire, but when it was marked, there was already missing the outer sheet of this quire.

This page contains two plans of complex east ends, or presbyteries, for large churches; the upper one is a design, the lower one is taken from the then existing Church of St. Stephen at Meaux, a town about twenty-four miles to the east of Paris.

The upper one bears the Latin inscription, in pale ink,—

“Istud bresbiteriu’ invener’t ulardus d’ hunecort & petrus de corbeia iñ se disputando.”

At the bottom of the page, in continuation of a description of the lower plan, is written, in black ink, the equivalent French inscription:—

“Deseure est une glize a double charole. K vilarsⁱ de honecort trova & pieres de corbie.”

“Ci-dessus est une église à double collateral, que trouvèrent Villard de Honnecourt et Pierre de Corbie.”

The two inscriptions may be rendered in English thus:—

“Above is (the presbytery of) a church with a double circumscribing aisle, which Wilars de Honcort and Peter de Corbie contrived together.”

To understand this plan it must be premised that in the early examples of radiating chapels a portion of the circular side-aisle wall was always left between each chapel, and had a window pierced in it to light the aisle. Of this system the plan at the bottom of the plate is an example, and our own Cathedral of Norwich may be added as an English specimen. In the thirteenth century these spaces were omitted, and the chapels placed close together, as at Westminster Abbey, and consequently a greater number were obtained. Their form continued for some time to be circular, as at Cambay, (Plates 67 and 27), but the polygonal form gradually superseded it during the course of the century.

ⁱ The K and V are run together in such a manner as to make it possible that the latter letter was intended for a W.—(W.)

The arrangement of these aisles and chapels admitted of great variety, into which it is not my intention to enter in this place, but merely to shew that the composition of such combinations must have been an architectural problem of great interest when the drawings in our manuscript were composed, and it was therefore quite natural that Wilars de Honecort and his friend Peter de Corbie should exercise their ingenuity upon a new solution of it. The novelty apparently consists in making the radiating chapels alternately square and round.

At Issoire, in Auvergne, the Romanesque church has a square chapel at the east end, placed between and in contact with two semicircular chapels, exactly as in Honecort's plan, but the two remaining radiating chapels to the westward of the former are separated from them by plain wall. The plan of Vaucelles given by Honecort in pl. 32 is of the same nature.

The complete series of alternately square and round chapels proposed by our author does not appear in any known example, as M. Lassus remarks, adding that such an arrangement would probably produce an unsatisfactory effect, because the square chapels, from their form and greater projection, would hide the semicircular ones. The nearest approach to this plan of Honecort's is the presbytery of Chartres Cathedral, erected at the very beginning of the century. This has a double circumscribing aisle, and a continuous series of seven chapels, all curvilinear in plan, but alternately deep and shallow.—(W.)

The singular arrangement of the vault of the compartment of the outer side-aisle which is opposite to each semicircular chapel deserves attention. Each of these chapels has a single middle vault-rib, which rises to the summit of the arch that separates the chapel from the aisle. (This rib springs from a vaulting-shaft, and its thrust outward is sustained by an external buttress.) But the thrust of the upper extremity of the rib upon the keystone of the arch is received by a pair of ribs which diverge from the opposite side of the keystone, and crossing the outer aisle rest respectively upon the piers that separate this compartment of the outer aisle from the inner aisle. Thus the compartment of the side-aisle is covered by three vaulting cells of a triangular plan without diagonal ribs^k. But the compartments of the side-aisles which are opposite to the square chapels are vaulted with diagonal ribs in the ordinary manner.

The vault of the outer side-aisle presents, in consequence, a series of compartments alternately of different and inharmonious forms. Such arrangements be-

^k In fact, the semicircular chapel and the neighbouring compartment of the side-aisle may be considered as covered by a single vault, with five ribs

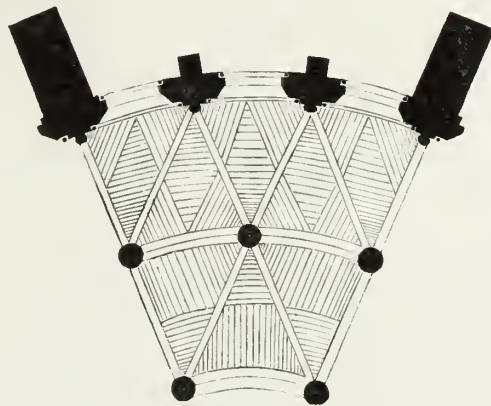
which diverge from the keystone of that pair which form the arch of separation between the chapel and side-aisle.—(W.)

long to the expedients of Romanesque masons, and a similar system is employed under the same circumstances at the Cathedral of Senlis. The vaults



No. 1.—Plan of the vault of one compartment of the double aisles, according to Wilars de Honecort.

of the inner side-aisle at the east end of Notre Dame de Paris present the same appearance in plan as this outer side-aisle, as the diagram No. 2 shews, but in reality there is a great difference between the two, for the points of intersection of the ribs in the latter are all at the same level as the imposts of the ribs; but at Senlis and in the design of Wilars de Honecort the points of intersection are at the level of the summits of the arches.—(L.)



No. 2.—Plan of the vaults of one compartment of the double aisles of Notre Dame de Paris.

DESCRIPTION OF THE SECOND PLAN.

THE lower plan bears the inscription, in pale ink, "Istud est presbiterium S^{ci} Pharaonis in miaus." This is written in the midst of the plan, like the Latin inscription of the upper one. But at the bottom of the page is written, in black ink, but in the same handwriting, "Vesci lesligement de le glize de Miax de saint Estienne."

"This is the plan of the Church of St. Stephen at Meaux."

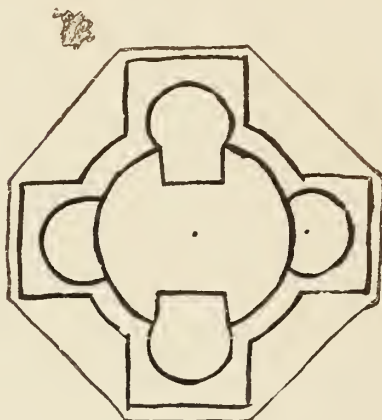
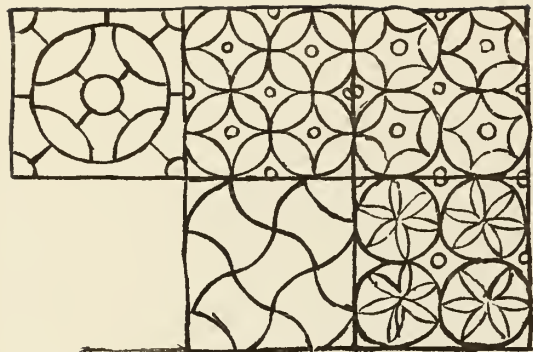
Thus the one inscription refers the plan to St. Faron, the other to St. Stephen, and we have to enquire which of these memoranda is correct.

The Church of St. Faron at Meaux is destroyed, but the plan of it, given in Plate 70, differs altogether from that of De Honcort. The Church of St. Stephen appears at first sight equally dissimilar, for it has five chapels to its apse, instead of the three shewn in the manuscript. But an attentive examination of this church (the Cathedral of Meaux) shews that the two chapels placed between the eastern one, and those on the north and south sides respectively, are interpolations of the fourteenth century. They must have been made since the year 1268, in which a document quoted by M. Quicherat¹ states that this beautiful and noble building was full of cracks and settlements, and on the point of falling into utter ruin. These additional chapels are nearly in the style of the fourteenth century, and their buttresses have on their faces tabernacles with pinnacles, which do not appear either on the original chapels, or in any part of the church. The sills and stringmolds of the additional chapels are also lower than those of the old ones, and the tracery of their windows different. In the interior, the piers placed between each pair of chapels have on one side bases and capitals in a more ancient style than on the other, and the vault-ribs also shew similar differences.

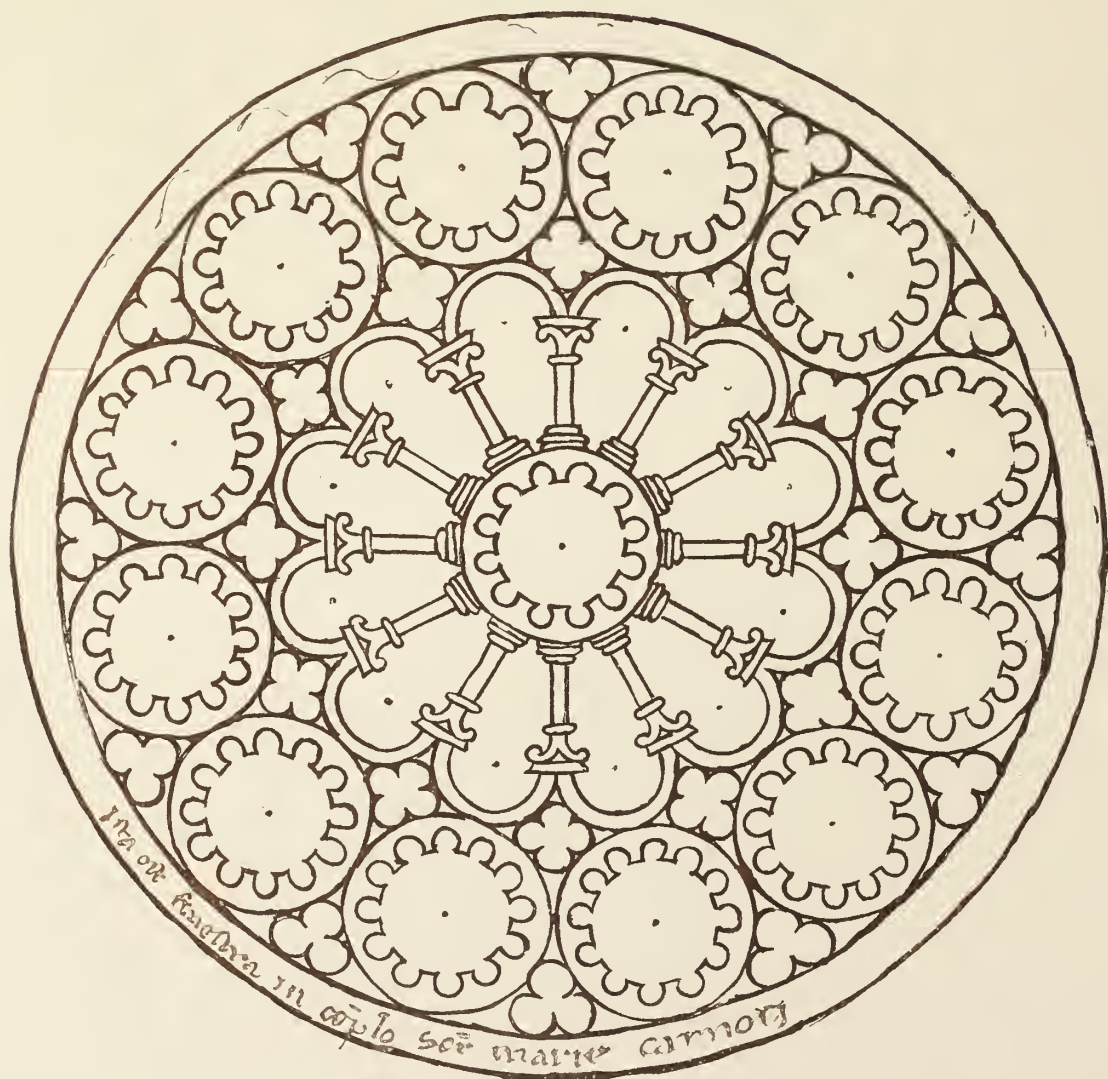
After M. Lassus had made the above observations, the recent restoration of the cathedral under the direction of M. Danjoy gave to that architect an opportunity of examining the chapels, and led to the discovery of the foundations of the plain circular wall which connected the ancient chapels, in accordance with Honcort's plan, and which had been demolished to make way for the entrance-arch from the side-aisle to the interpolated chapel. He also found the base of

¹ A notice issued by the Bishop Jean de Poiney in the documents attached to the History of Meaux by D. Toussaint du Plessis.—(*Revue Archéologique*, t. vi. p. 182.)

chi prennent marere don pilee
metre advoire lorson5



Jestone une fois en Hongrie la v ie mes maunt
lor la uio le pauement d'une glize des faice
maniere



CATHEDRALE DE CHARTRES

ROSE DE LA FACADE

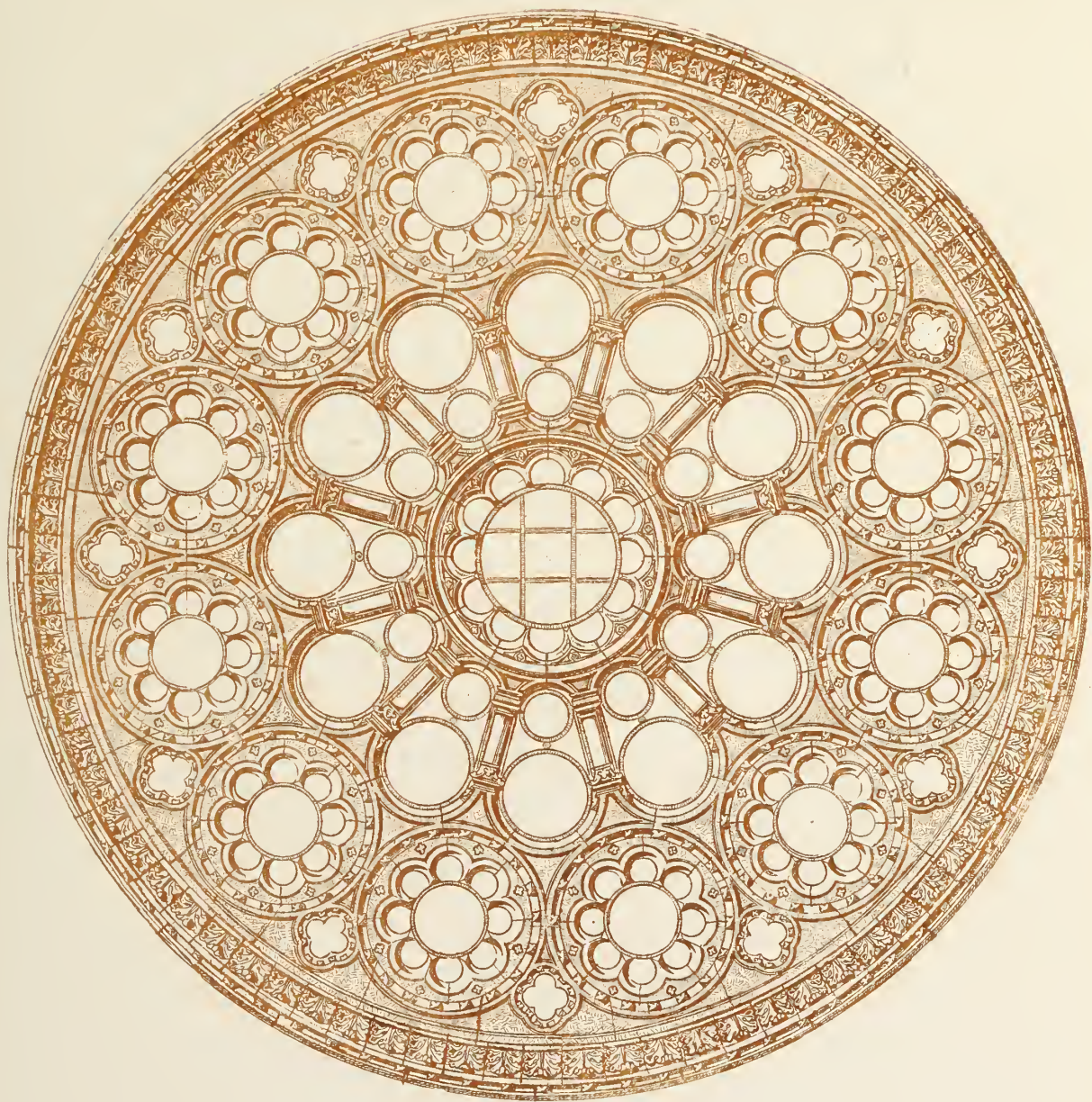


PLATE XXIX.

VERSO OF THE FIFTEENTH LEAF.

“Jestoie une fois en Hongrie la vie mes maint jor la vie le pavement d’une glize de si faite maniere.”

“J’étais une fois en Hongrie, là où je demeurai maints jours, et j’y vis un pavement d’église fait de telle manière.”

“*I was once in Hungary, and there remained for many a day. There saw I the pavement of a church made in this wise.*”

WILARS DE HONCORT gives the tracings of five different patterns contained in as many square compartments. If we consider each compartment to represent a separate paving-tile or stone, it must be composed of a stone incrustated with coloured pastes, or of terra-cotta incrustated in different colours.

But if we take the whole drawing to be made up of five separate drawings, each representing a portion of a different pavement, which is the most likely interpretation, then it follows that each pattern is composed of a mosaic of marbles, or different coloured pieces of terra-cotta. The first material is the most probable, because the angles of some of the pieces in the stars of the last design appear too acute for terra-cotta.

The last design but one, which is all made up of pieces of the same shape throughout, bounded by two concave and two convex arcs, is very common in Arabian constructions, and is also found in the eighth century in the borders of Carolingian miniatures. This mosaic-work has nothing in common, as far as design, with the Italian mosaic of the middle ages which bore the name of *opus Alexandrinum*.—(L.)

The patterns are all of a kind that admit of being composed of separate pieces, for it will be observed that every constituent piece has a simple and distinct outline. But in patterns formed by inserting into recesses sunk on the face of a stone or tile, clay or other pastes of a different colour, the recesses are either grooves or florid forms that shew clearly how the pattern is made.—(W.)

“Chi prenes matere don piler metre a droite loisons.”

“Iei prenez exemple pour faire un pilier à joints cachés.”

“Take here an example of a pier with a correct bond, or joints.”

° *Joints cachés* in the translation given by the French editors. It is perfectly true that the effect of the joints delineated is to place them in a position where they are concealed, but *droite* will not bear

The plan represents one of the piers of Rheims, and is repeated upon Plate 62 in a more complete form, to which we may therefore refer for the explanation.

~~~~~  
 “Ista est fenestra in templo Sce Marie Carnoti.”

“C'est la fenêtre de l'église de sainte Marie de Chartres.”

“*This is a window of the church of Saint Mary at Chartres.*”

This sketch of the rose window of the west front of the Cathedral of Chartres is tolerably exact, as will appear by comparing it with the actual window shewn in Plate 71. But Honecort has introduced several variations which appear to be intentional, for he belonged to a generation of architects whose compositions possessed greater lightness than those of their predecessors, which still retained the solid character of the Romanesque. An architect who had seen and studied the apse of Rheims would find the rose of Chartres too full of plain surface, and would be tempted to add openings where none existed, and to enlarge the existing ones. In Honecort's drawing the bases of the radiating columns rest on the circumference of the central circle. In the real window they spring from a plinth, which is indented so as to form an external foliation to the central circle. The quatrefoiled openings between the arcade and the outer circles have no existence in the real window, and the external quatrefoils of the latter are changed into trefoils, which fit their places better and admit of a larger opening. The drawing is a bare outline or simple souvenir of the general form, omitting details of sculpture and construction, but sufficient for a man thoroughly acquainted with the practice of his own time.—(L.)

It may be added, that Honecort has placed his great circles in contact with the heads of the arches of the central arcade, instead of which, they rest in the space between two arches in the real window. This alteration gets rid of the triangular blank spaces of the latter, which are too small for piercing, and substitutes a large quadrilateral space that admits of a quatrefoiled opening. His great circles have all twelve foils, but in the real window the central circle has twelve foils, and the outer circles have only eight. It may be doubted whether these variations were intentional, or the mere result of the sketch having been made from memory.—(W.)

that sense: it appears rather to be used by Honecort in the sense of *right*, or *correct*, as in Plate 60, “d'autretel maniere doivent estre celes de Canbraison lor fait droit,”—“In the same form ought to be

the chapels of Cambray, *if they make them right* ;” which the French editors render “si on les construit,”—“*if they make them at all.*”

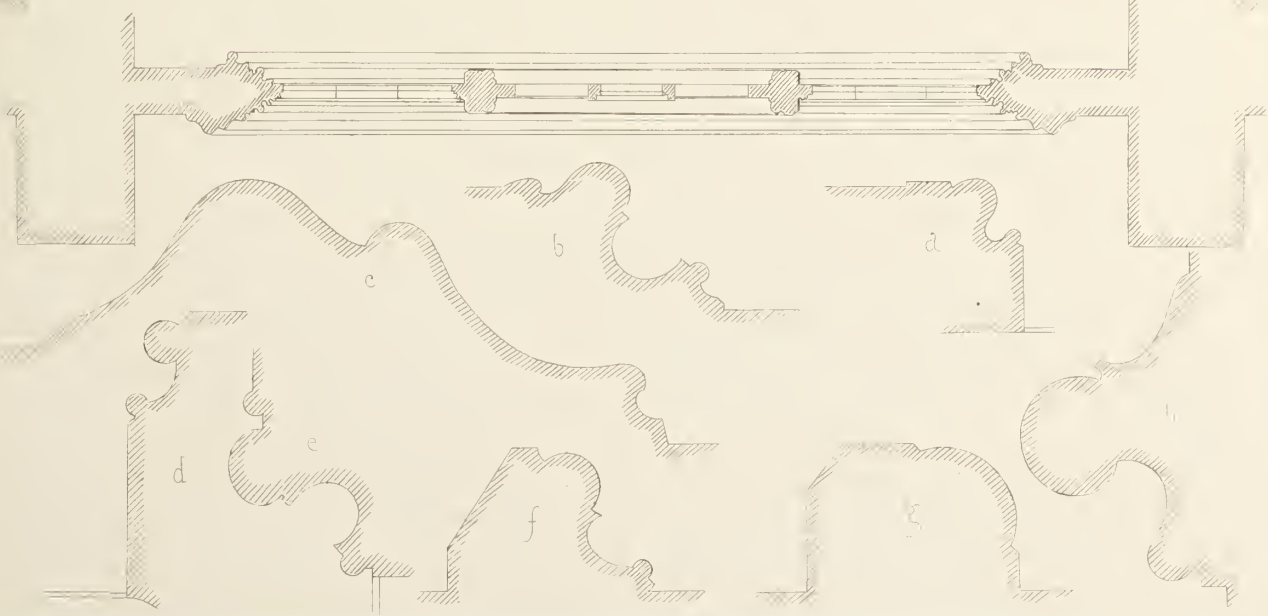


7





TRANSSEPT MERIDIONAL.





## PLATE XXX.

RECTO OF THE SIXTEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH  
THE LETTER *q*.

“C’est une reonde veriere de le glise de Lozanc.—Ista est fenestra in Losana ecclesia.”

WITHOUT this double inscription it would have been impossible to suppose this sketch to have been intended for the magnificent rose of Lausanne, the variations from the reality, as shewn by Plate 72, being so great. The sketch must have been made from memory, if not from a mere passing glance at the window. The central square is tolerably well filled up, but is placed square in position instead of lozengewise. The semicircular spaces which rest on each side of the lozenge in the original are totally omitted. The eight small trefoil openings are undoubtedly correctly placed in the outer circumference, but the large quatrefoils between them afford but a miserable substitute for the rich quatrefoiled circles of the original. In fact, the unique principle of this remarkable composition is wholly lost. I would rather believe that the drawing was made up by its author, long after his visit to Lausanne, from a few hasty lines scratched on the spot upon his tablets, than follow M. Lassus in supposing that the window was so lighted when he saw it as to conceal the characteristic lines which he has omitted, or that he drew it from the inside of the church<sup>p</sup>.—(W.)

Below the window is the figure of a bearded man in tunic and mantle, seated, and holding with his right hand the foot of his left leg, which is crossed over his right. He looks upward, apparently conversing with some one above. This may perhaps represent Moses putting the shoes off his feet at the burning bush.—(L.)

<sup>p</sup> I consign to a note the following remarks of M. Lassus, which are valuable in themselves, but have no direct reference to the illustration of our author, who cannot for a moment be supposed the architect of Lausanne Cathedral. “The important differences between the original and the drawing of the Lausanne window seem to prove that Wilars de Honecort was not the architect of the church of Lausanne, for in that case he would certainly have made a correct drawing of his own work. In describing the tower of Laon (Pls. 17, 18), we have already pointed out the resemblances which M. Ramé

detected between the churches of Lausanne and Laon, and which prove French influence. Moreover, as history records that the Bishop of Lausanne, who presided over the reconstruction of his church after its destruction by fire, finished his days in the diocese of Cambrai, we may suppose, with M. Ramé, that the same architect who had built the Picard cathedral might have also built the Swiss cathedral. But the unfortunate testimony afforded by the inaccuracy of Honecort’s sketch destroys altogether, in our opinion, the supposition that he was the person charged with this work.”—(L.)







## PLATE XXXI.

## VERSO OF THE SIXTEENTH LEAF.

A PERSONAGE, still young, with full drapery, but naked feet, is seated on an ornamental bench, the eyes are raised upwards, the left hand points forward with the fore-finger, but the right hand, evidently raised, is not drawn. This must be a study for a figure of Christ teaching.

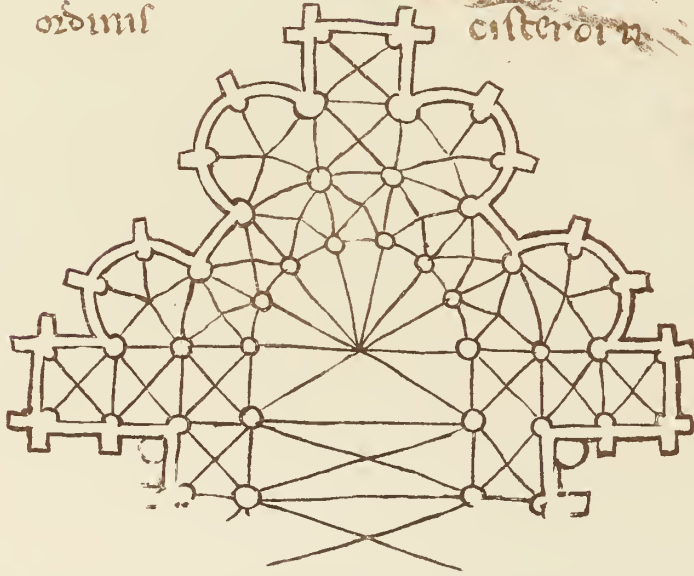
The grand style of the drapery, the calm serenity of the countenance, and the careful drawing of the extremities, place this sketch amongst the best in the volume. The careful perspective of the seat shews that it was intended for, or copied from, a mural painting.—(L.)







istud est presbiterium beate marie uacellensis  
 ecclie ordinis cisterciensis



Ce est un image de dieu si come il est deus.



## PLATE XXXII.

RECTO OF THE SEVENTEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH  
THE LETTER *r*.

“Istud est presbiterium beate Marie Vacellensis, ecclesie ordinis Cisterciensis.”

“C'est le chevet de la bienheureuse Marie de Vaucelles, église de l'ordre de Cîteaux.”

“*This is the presbytery of the Church of St. Mary at Vaucelles, of the Cistercian Order.*”

THE church in question was erected in the neighbourhood of Cambrai, and dedicated in 1235 by Henry de Dreux, Archbishop of Rheims. It was destroyed long ago, but existed in 1713, when the two Benedictines, Martène and Durand, describe it as a magnificent church four hundred feet in length<sup>1</sup>.

The views of the abbey published in the eighteenth century give no idea of the form of its apse. The plan in our manuscript partly resembles the joint design of Wilars de Honecort and Peter de Corbic (Pl. 28). There is the same square eastern chapel uniting the two circular radiating chapels, or “*absidioles*.” There is also on each side of the choir the same rectangular chapel accompanied on its east side by a circular chapel. But the square chapel which connects, in Honecort's design, the two neighbouring circular chapels, has no existence at Vaucelles, where the square chapels have each two compartments in depth, and communicate by an open arch with the adjacent absidiole.

As already remarked in the notice of Plate 28, this terminal square chapel is a concession to the ancient Cistercian forms; but as the transept of Vaucelles is not shewn in this plan, we cannot tell whether the parallel chapels on the east side of the transept, which is characteristic of the order, were employed in this instance.—(L.)

It may be worth remarking, that if a square chapel be inserted in this plan on each side of the apse between the two separated semicircular chapels, by treating the two neighbouring buttresses as the piers of entrance to the square chapel, we obtain the plan proposed by Honecort and his friend in Plate 28, even with respect to the peculiar vaulting-lines of their semicircular chapels. For by this change each of the semicircular chapels at Vaucelles is left with a single external buttress, and Honecort's external side-aisle arises naturally out of the inner com-

<sup>1</sup> *Voyage littéraire de deux religieux Bénédictins, &c.* Par. 1721—1724.

partments of the square chapels, alternating with the three inner triangular vaulting-cells of the circular chapels, and thus leaving only the two outer triangular vaulting-cells for the circular chapel.—(W.)

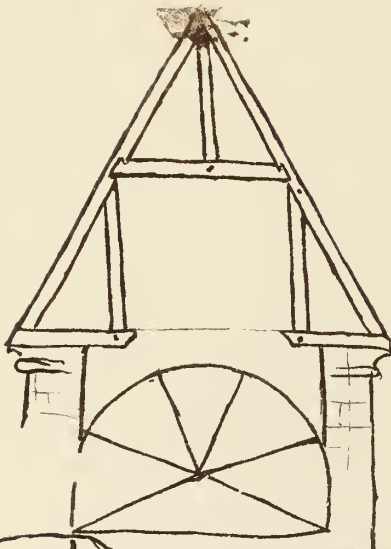
~~~~~  
 “Ce est un imaie Deiu si cume il est cheus.”

“*This is a figure of our Lord when He fell prostrate.*”

This may either represent the agony in the garden of Gethsemane, when “He fell on His face on the ground and prayed,” or the fall under the weight of the cross on the road to Calvary^r. This admirable figure, expressive of such utter exhaustion, is open to the criticism that the left foot is in so forced a position as to make its connection with the leg very difficult to comprehend. But on the contrary, the hands, which support the weight of the body, are drawn with remarkable truth; the manner in which their form is given in a mere general outline, is exemplified in other parts of the manuscript^s.—(L.)

^r Compare Plate 45.

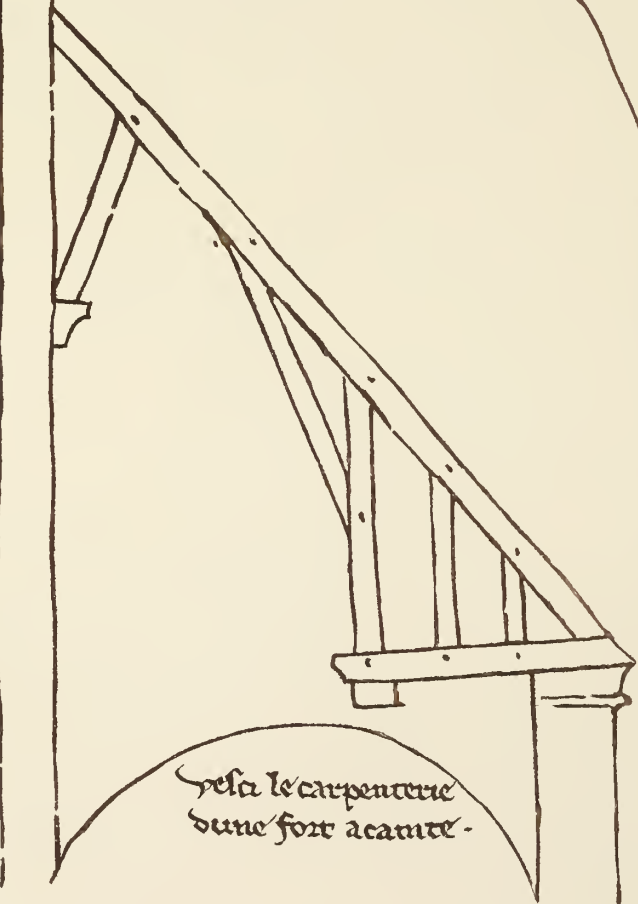
^s In Plates 10, 50, 55.—(W.)



Or poef uer .i. bõ conble leg.
 por hierbegier de seur une
 chapele auotte.



Et se u' uoies uer .i. bon
 conble legier auotte de fust
 prendes aluec garb.



Veici le carpenteeie
 dune fort acante.

Veici une esconle q' bone
 est amonel por loz candelles
 porter argans. faue le poes
 se u' fauel cozier



PLATE XXXIII.

VERSO OF THE SEVENTEENTH LEAF.

UPON this page begins a set of drawings of carpentry which, judging from the mention of the subject at the beginning of the manuscript on Plate 2, may have extended over the succeeding pages. Unfortunately, the four following leaves are missing, including eight pages, and thus we are probably deprived of a series of many drawings of wooden framing, of which those on the present page seem to be the beginning. In Plates 43 and 44 are some wooden machines and constructions which must also have been amongst those alluded to as “engiens de carpenterie,” or “devices of carpentry,” in the general summary on Plate 2.

“Or poes veir .i. bon conble leger ^t por hierberger deseur une chapele a volte.”

“*You see here a good light (or simple) roof to cover a vaulted chapel.*”

This might be described as a queen-post roof, of which the central portion of the tie-beam had been cut away, the object of the construction being to allow the upper surface of the vault to rise above the level of the walls, and thus to enable them to be made lower than if the tie-beam were carried across. The vault indicated below it is rather a plan of the chapel than a section of the vault. This frame is too weak to serve for wide spans.

“Et si vos voles veir .i. bon conble legier a volte de fust prendes aluec gard.”

“*And if you would see a good light (or simple) roof for a wooden vault, look carefully at this.*”

This second roof, partly framed with arched or embowed pieces, is intended to be lined beneath with thin boards forming the surface of a waggon-vault, like many that still remain in England^u.

“Vesci le carpenterie d'une fort acainte.”

“*Here is the frame of a strong penthouse roof.*”

That *açainte* means a side-aisle is shewn by the legend attached to Plate 62,

^t *Léger*, as M. Quicherat observes, is in old French usually employed in the sense of “*easy to construct or do.*”

^u The roof of Old Basing Church, Hampshire, is the nearest to this in general appearance that I have been able to discover, but is much later in style. It is engraved in Mr. Clutton's “*Examples of Eccle-*

siastical Perpendicular Roofs,” for Weale's Papers on Architecture. It may be compared with Little Coxwell, Berkshire, (Parker's Glossary, Plate 174.) At the left side of the roof near the apex a single crocket between two parallel lines is sketched, as if it were the beginning of a drawing for the decoration of the gable.—(W.)

and the passages quoted by Du Cange under the word *accincta* prove that the same word was applied to any penthouse^x.

This roof is intended to cover the side-aisle of a church above the vault, the upper surface of which is indicated by the curve line in the drawing. Its rafter bears on the end of a hammer-beam, to which it is also connected by three vertical posts. A brace rests on a corbel in the main wall, and supports the upper part of the rafter, which is also sustained by a second brace which springs from the inner post of those that connect the rafter and hammer-beam. The square block under the inner extremity of the hammer-beam appears to represent the section of a longitudinal beam, the extremities of which may be supposed to rest upon low walls carried up over the transverse ribs of the vaults, so as to support the ends of the hammer-beams without allowing them to rest on the vaults.—(L.)

“Vesci une esconce qui bone est a mones por lor candelles porter argans. Faire le poez se vous saves torner.”

“*This is a sconce which is useful to monks to carry their lighted candles. You can make it if you know how to turn.*”

The thing represented in the figure is frequently mentioned in mediæval writings under the name of *absconsa* (see Du Cange). It is, properly speaking, a ventilated case in which a candle may be burned (without displaying its light in all directions: *Anglicè*, a dark lantern). The legend shews that it was made in the lathe, and was principally employed in convents where the religious had to traverse by night their cloisters and courts with lighted candles^y.

John de Garland, in his Dictionary, compiled at the end of the eleventh century, gives the monks two kinds of shades for protecting their candles, “*crucibulum cum sepo et absconsa, et laterna*,” that is to say, the night-light or watch-light with tallow, in a dark-lantern, and the common horn-lantern which exhibits the light. The figure in the manuscript must be the dark-lantern, or *absconsa*, because in this elegant vessel no openings appear, excepting those which are necessary to introduce the candle and let out the smoke.

This *esconce* differs from those represented in cotemporary manuscripts, and the legend which explains how it was made would have been sufficient to have

^x Note by M. Quicherat, p. 179, *Revue Archæol.*, t. 6.

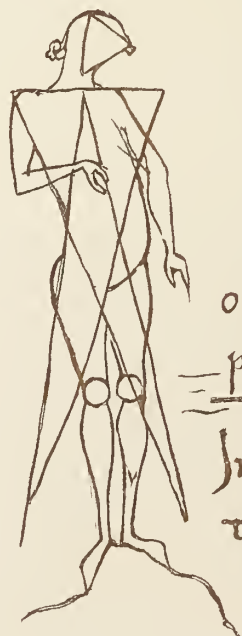
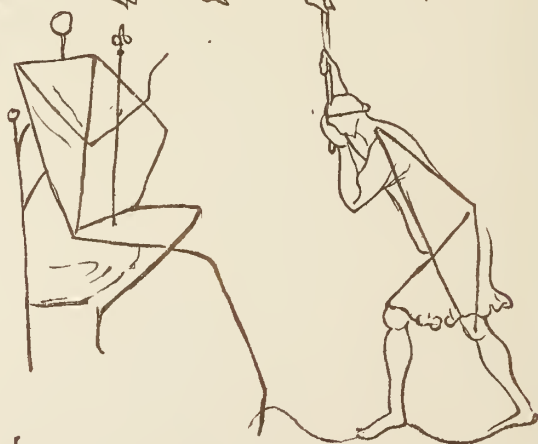
^y Quicherat, p. 223.

proved that the lathe was used in the middle ages, if so many remaining works had not themselves already taught us that fact^z.—(L.)

The lanterns in miniatures, especially in the nocturnal scene of the arrest of our Saviour, are nearly the same as those which are in common use at present, consisting of a frame of thin metal garnished with horn, and having a conical cover. A square handle serves to hold them by, and is so formed that it may be attached to a long staff, so as to enable the light to be raised high up, to light a company, or be seen afar off.—(A. D.)

^z The lathe used in the thirteenth century was of the simplest form, with a spring pole and cord coiled round the work. The lathe with continuous circular motion is represented in the drawings of Leonardo da Vinci, and has a great wheel beneath the bench, moved by a pedal connected to a winch fixed to the

axis of the wheel. The object to be turned is attached to an axis, or mandrel, which carries a small grooved pulley, and an endless band communicates the motion of the great wheel to this pulley, exactly as in the ordinary lathe of the present day.—(A. D.)



ohi commence le mate de la
 — portraiture —

Incipit materia portava
 ture

THE ELEMENTS OF PORTRAITURE.

PLATE XXXIV.

RECTO OF THE EIGHTEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY
WITH A CAPITAL S.

This leaf is the third of the fourth quire, the first two leaves of which are wanting, and also the last two leaves of the third quire, making altogether a loss, anterior to the fifteenth century, of eight consecutive pages, as already remarked. On one of the slips from which these pages were cut the letters *d* and *ba* remain.

“Chi commence le mate de la portraiture.”

“Incipit materia porturature.”

“*Here begin the elements of portraiture.*”

These two inscriptions the author has written at the foot of the page in the same pale ink as the sketches. On the reverse side of this page, upon which this series of drawings is continued, a third inscription to the same purpose is added, which may be given in this place for the sake of comparison. It is written in darker ink and in a more compact character.

“Ci comence li force des trais de portraiture si con li ars de iometrie les ensaigne. por legierement ourer. et en lautre fuel s’r cil d’le maconerie.”

The interpretation of this appears to be,—

“*Here begin the powers of the lines of portraiture for facilitating work, as taught by the art of geometry. On the other leaf will be those of masonry*.”^a

Four pages in succession are exclusively devoted to this method, and fortunately in a part of the manuscript which has escaped mutilation. At the bottom of the last is an inscription which shews that in these four we have all that the author recorded in illustration of this subject^b.

^a The translation in the French edition is simply “Ici commence la méthode du trait pour dessiner la figure ainsi que l’art de la géométrie l’enseigne pour facilement travailler.” I have ventured to substitute new descriptions of the four plates on the Elements of Portraiture instead of the concise notices in the

French edition.—(W.)

^b The author has also employed his method in Plates 41 and 61, but these were never intended to form part of the treatise, or rather series of drawings, under consideration.—(W.)

“En ces .111j. fuelles a des figures de lart de iometrie. mais al conoistre covient avoir grant esgart ki savoir velt de q' cascune doit ourer.”

“*In these four pages are figures of the art of geometry ; but to understand them great attention must be given by any one who would comprehend the peculiar use of each.*”

This art of geometry has been admirably characterized by M. Quicherat as follows^d :—

“It would be extremely difficult to give a precise definition of this method, so arbitrary is it in application. The process consists either in reducing human forms to simple lines, or in reducing the representations of human or animal figures to elementary forms, such as triangles or squares set in juxtaposition^e. All this is done without calculation or principle, so that geometry has no other office than to furnish the forms and nomenclature of a very questionable approximation. The processes in question teach, not a science of drawing, but a mere art of readily reproducing certain attitudes, by merely retaining in the memory the simple geometrical figures which are respectively associated with them. Thus, eye and hand would become the slaves of habits which, because they dispense with the study of nature, make drawing easy, according to the boast of Wilars de Honecort.”

“The *matière de portraiture* is, in truth, a mere routine, and the drawings are a set of patterns for a certain number of selected subjects. But it is remarkable that the peculiar attitudes and aspects produced by this method are precisely those which characterize the works of the painters and sculptors of the thirteenth century.”

It may be inferred that Wilars de Honecort does not claim the invention of this system, but merely the composition of a sufficient number of elementary figures to place it upon record for the use of posterity. The drawings exhibit several distinct methods. First, a diagrammatical representation of a human figure, viewed in front or obliquely, which consists in substituting for the body an isosceles triangle, with its narrow base upwards; the head and neck are supplied by a little circle on a stem placed in the centre of the base. The angles of the base are the shoulders, from which proceed the arm, fore-arm, and hand in the guise of straight lines meeting at the angles corresponding to their required positions. The lower limbs are similarly indicated by straight lines, but the thigh-lines diverge together from the apex of the triangle, ignoring the fact that their proper articulations with the body are separated by nature nearly as

^d *Revue d'Archéologie*, p. 211.

^e After the manner of the Chinese puzzle.—(W).

widely as those of the arms above. Nevertheless, this artifice supplies a spirited and unmistakable representation of human attitudes. Two examples only are given in this treatise, both of them in the plate under review. The first represents the infant Jesus on the knee of the Virgin. The infant is a pure specimen of this artifice, the female figure is drawn in the same way, but lines representing the drapery have been added. Yet we see the triangle inclined forwards, and the right arm represented by two lines, but plainly sustaining the leg of the child. The square below seems to represent the seat, of which the back rises in a single line terminated by a knob. One leg of the female is seen in front. The second specimen is a king seated on his throne. But in the sixty-first plate the author has delineated the angels that crown the buttresses of Rheims in this manner, and also the figures in the wheel of fortune in Plate 41.

The second method consists in selecting some simple and easily recollected geometrical figure, the lines or angles of which will coincide with the leading lines or points of the natural figure, so that by drawing the first the arrangement of the second may be reproduced by merely filling it up with the necessary details.

Thus a rectangle, raised above the ground to a distance equal to its height, serves as the foundation for the body of a stag. A right-angled triangle, with the longest side in front, and vertical, and of which the right-angle coincides with the upper corner of the rectangle, indicates the place of the neck. A third and smaller triangle seems to guide the outline of the face, but is imperfectly drawn. The sheep in the next plate is sketched on the same principle, and should be compared with the stag.

Beneath the stag is a man thrashing with a flail. This is an example of a figure viewed sideways, and the diagram employed in this case is repeated in several other side-views of men in different positions, which by comparison serve to illustrate the method. These are in Plate 36, the mower with his scythe, the two figures blowing long horns, and standing back to back, and the sitting figure with a child on its knee.

In the front, or oblique views, as already explained, a triangle represents the body, and in these side-views, as in the thresher and mower, a single line from the shoulder to the hip appears to be this triangle seen edgewise. Two lines radiating from its lower extremity represent the thighs, a third, joining the upper end of the body line with the knee of the hinder leg, forms a triangle, and governs the front of the body, or rather, perhaps, the direction of the front outline of the thigh.

The extremely elementary sitting figure at the bottom of Plate 36 seems to shew that the ruling principle of all the above-cited examples of side-figures is to represent the body in a side view from the hip upwards by a nearly isosceles triangle, with a short base downwards. Some additional remarks will be found in the explanations of Plate 36.

At the bottom of Plate 34 is a pair of figures which appear to be a man and woman, the one in a bold and manly attitude, the other submissive.

In these figures a small triangle is employed for the face, and the usual triangle for the body. But to obtain the solid form of the legs, and in some respect their direction, the sides of the triangle are continued downwards to the ground, and two lines diverging from the centre of the horizontal upper side of the triangle meet these sides so produced on the ground line. The left side of the diagram so obtained strictly governs the left half of the male figure, and his left arm has its outer outline formed of a straight line springing from the angle of the triangle, and meeting a second straight line with a curved stroke at the end to designate the fore-arm and hand. But solidity is given to the arm by the addition of a freely drawn inner outline; and thus it is explained that the diagrammatic arm indicates the outer outline^f. The right side of the figure is sketched in a spirited and natural manner without respect to the geometrical lines^g. In the female figure the greater part of the diagram seems to be useless. In Plate 36 we shall find a figure in which this diagram is rigidly employed for the whole.

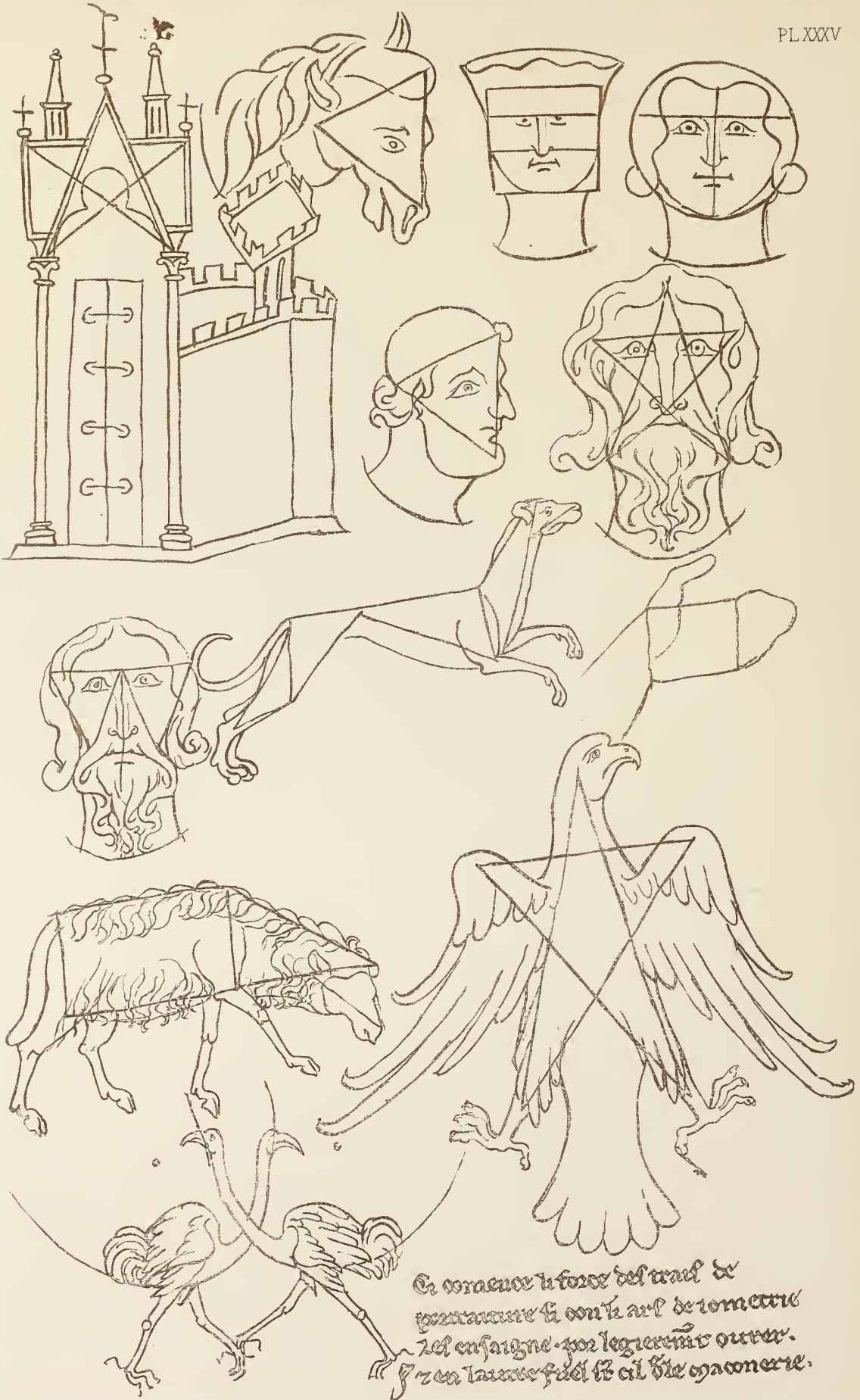
In the upper corner of the page is drawn a grand head, which M. Lassus suggests to have been a St. Peter, and inserted in this manner by the artist by way of shewing that he could himself dispense with the elementary methods that he has taken such pains to display for the use of others^h.—(W.)

^f This is not always the case. In the right arm of the king two lines are added for the solid outline, which place the diagrammatic one like a bone in the middle of the real arm.—(W.)

^g The minstrel in Plate 50 is so similar to the man above described, that the foundation of his contour must have been laid in the same manner, although no geometrical lines are shewn.—(W.)

^h The first method may be supposed to proceed upon the principle that the lines of the diagram re-

present the bones of the skeleton, and thus the attitudes of the human figure are represented by first drawing the bare bones and then clothing them with flesh. If the diagram be modified so as to bring it more into harmony with the real arrangement of the articulations, and its lines drawn with a due attention to foreshortening, this system becomes a reasonable and scientific one. It was, in fact, proposed in this form by Lautensack in his *Ars Perspective*, Frankfurt, 1564.—(W.)



Et commence li force del trait de
 portance li con li art de rometre
 del ensaigne por legierement ouvrir.
 Et en la terre fu el li cil die oiaconerie.

PLATE XXXV.

VERSO OF THE EIGHTEENTH LEAF.

IN this page there are several examples of the use of the peculiar star-shaped pentagonal figure which was known as the Pentagram or Pentangle, attributed in the olden time to Pythagoras or Solomon, used as a mystic symbol, and as such employed by the Freemasons, and invested with magic powers. Wilars de Honecort has inscribed a small pentagram on his sketch of a tabernacle in Plate 17, and in this page he has used it to regulate the proportions of the front gablet of a tabernacle, and of the ridge of its lateral gablets in height and in length. The same figure is employed for the face of a bearded man. Its five points determine respectively the position of the apex of the forehead, the breadth of the face at the level of the eyebrows, and the breadth and position of the angles of the lower jaw; the point of the nose is seated at the intersection of the two lower sides of the figure. In the spread-eagle the pentagram is drawn so irregularly as to serve no apparent purpose¹.

At the top of the plate is a horse's head, with a man's head beneath it, both in profile; and an equilateral triangle, with its front side vertical, is inscribed in each in a manner as nearly similar as the dissimilarity of the two will allow. The triangle, but not equilateral, appears to be the universal foundation for the side view of an animal's head, for it occurs again in the stag, the greyhound, the sheep, and the pig. In the man's profile the head is completed by placing a semicircle on the upper side of the triangle.

A man's front face is sketched by drawing a square, and dividing it by two lines into three unequal compartments. The chin is formed by a portion of the circle which would be inscribed in the square, the upper line determines the place of the eyebrows, the lower the point of the nose.

Next to this is a circular face, such as children draw to represent the man in the moon: a transverse line at one-third of the diameter from the top determines the level of the eyebrows, the tip of the nose is half way from this line to the chin. In the third row, a venerable countenance is characterized by a pair of triangles. In Plate 37 will be found another head of this class¹.

¹ It may be worth mentioning that the length of each ray of a regular pentagram is equal to the diameter of its pentagonal body.

² An equilateral triangle, similarly placed to that of the head in the second row, is employed by Fra Luca Pacioli da Borgo for the demonstration of the

It seems as if the principle of Honecort's method was that each countenance or object should suggest its peculiar diagram to the artist, by means of which he might sketch it more faithfully and recollect it. Indeed, guide-lines are often either drawn, or imagined to exist, in the modern methods of sketching, and such diagrams as our author gives might have been traced upon a drawing of the middle ages which it was intended to copy, for the same purpose as the squares which are now usually ruled to guide a copyist, especially in reducing drawings or plans.

A greyhound and a sheep have each the neck and head composed of two triangles set in juxtaposition. The body of the sheep is a rectangle, like that of the stag in the last plate; but the lanky greyhound has a pair of triangles ingeniously substituted for this rectangle.

In the third line the outline of a human hand is formed by a square with a thumb added to it, and the general contour only of the fingers indicated by a curved line. This is so rough as scarcely to deserve attention, were it not that the hands of the figures in Plates 32, 50, and others, shew that our author employed this mode of delineating the extremities.

Finally, at the bottom of the page a pair of circular arcs are used to give character to two ostriches, or, rather, to draw them alike. The inscription beneath the page has been already explained.—(W.)

proportions of the human face and head in profile. (*Divina Proportione*, pars prima, p. 25, Ven. 1509.) The face is divided by horizontal lines into three equal parts; the first extending from the forehead to the top of the eyelid, the second to the point of the nose, the lowest part is divided by two lines into three

equal portions, of which the first line coincides with the mouth. This is nearly the same as in Honecort's circular face. Such rules are probably of great antiquity. Albert Durer has some similar diagrams in his book on Human Proportions.—(W.)



PLATE XXXVI.

RECTO OF THE NINETEENTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE LETTER T, (OR, ACCORDING TO M. LASSUS, A POSSIBLE V.)

THIS page contains several examples of figures in pairs set symmetrically in opposition, as the two trumpeters back to back, and two groups of wrestlers; besides the first figure on the page, which is evidently intended to be filled up so as to represent two men looking in opposite directions. The two trumpeters^k are sketched upon an inverted pentagram; if this pentagram be divided by a vertical line into two equal halves, it will be seen that each trumpeter is governed by the same diagram as the mower and the thresher, already described in p. 111. In the unfinished double man at the top of the page each figure is founded upon a pair of triangles resembling the letter K. The same K-shaped diagram is used for the wrestlers beneath the trumpeters, but as these men stand face to face the two K's unite, and produce a diagram resembling an upright square containing a diagonal square.

The second group of wrestlers on the right hand of that just described is circumscribed by a kind of beehive-shaped diagram, the lines of which appear to have been sketched merely to assist in drawing the two opposite figures alike.

In the second figure of the upper row the usual triangular body is employed, with its sides continued downwards to assist in giving position to the right leg, but on the left side to that of the thigh only. On the other hand, the third figure of the second row is an example of the complete application of the same diagram, which is used in a partial manner for the two figures at the bottom of Plate 34, but which here produces a sturdy warrior standing in an attitude of defiance; his head, perfectly circular, is drawn like that in the right hand upper corner of the last plate, and in nearly all the profiles of this page, the diagram of that in the second row of that plate is used as a short-hand mode of indicating the head and face, and in general the knee-joint, whether viewed in profile or in front, is drawn as a complete circle.

^k The slightly curved trumpet here represented, which was in general use in the thirteenth century, is termed a *bosine* in a manuscript of the Apoclypse cotemporary with Wilars de Honcourt:—"Et li sep-

time angle sona sa *bosine*," says the text, and the accompanying drawing shews an angel sounding a trumpet like those represented in our manuscript.—(A. D.)

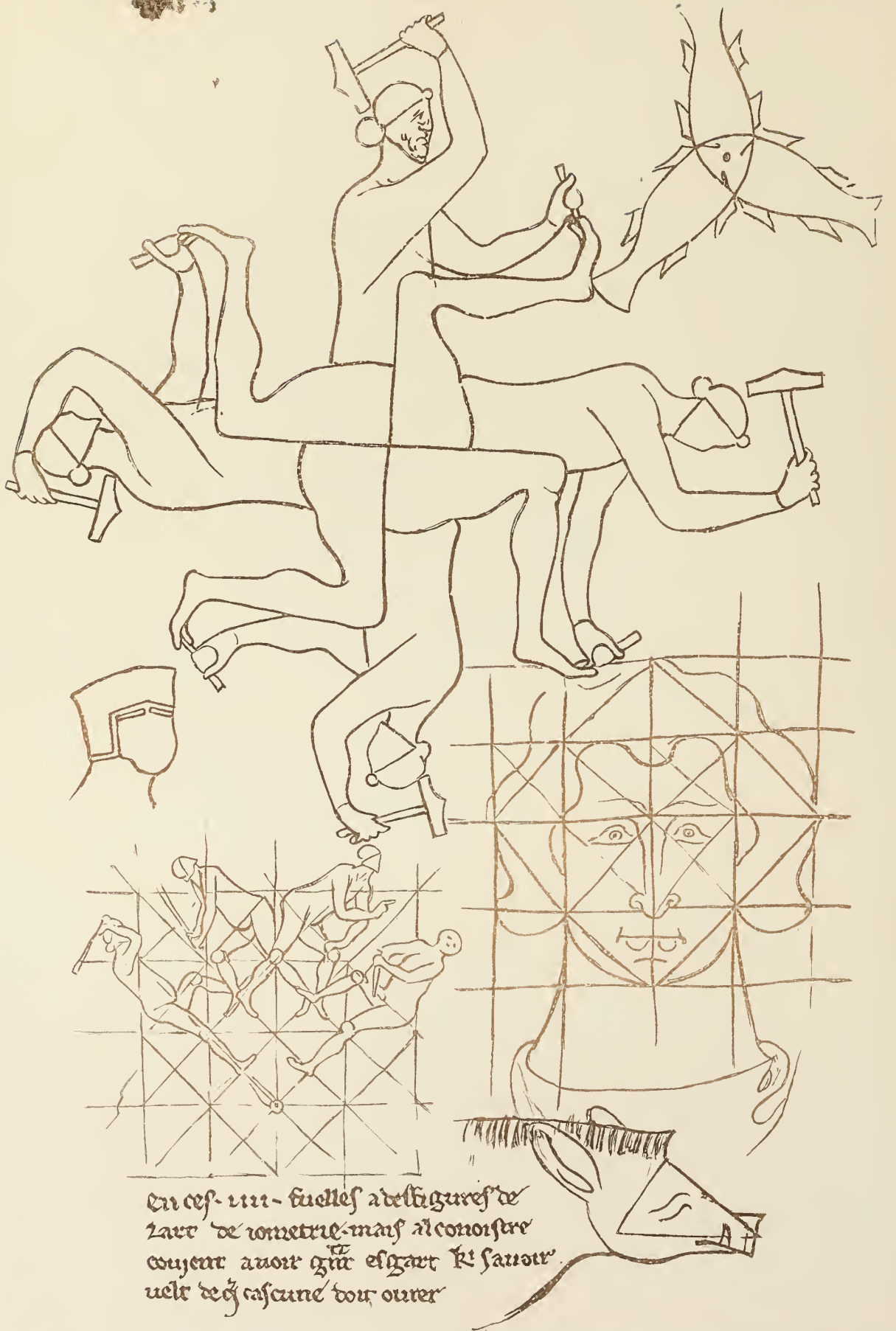
The last figure in the upper row seems, like the first, to be incomplete. In the second row the monk's frock is whimsically obtained by reversing the usual triangle.

The cavalier in the third row is, as M. Quicherat observes, the type of that which is reproduced upon so many mediæval seals, and is a most curious example of the system on account of the ingenuity with which the leading lines are subjected to a star, formed by eight rays, diverging at equal angles from a point determined by the intersection of the level line of the horse's back with the front outline of the rider's body.

The two crouching lions, resembling those which are so commonly found in the church portals of Italy, are each well characterized by a triangle on a horizontal base, with one acute and one obtuse angle¹. The object of setting two symmetrically opposite appears to be to shew the use of these diagrams in drawing reversed figures exactly alike, of which process the two trumpeters and the wrestlers beneath them are also such excellent examples. The pairs of figures so arranged in Plates 10, 14, 25, 27, and 50, were probably produced by diagrams of this nature.

The seated figure with a child on her lap, next to the lions, has been already noticed in p. 112; and lastly, two flowers, the one containing a pentagram, the other a six-rayed star, shews that the method was extended to flowers.—(W.)

¹ It is probable that the diagram in this case is an inverted pentagram with its lower ray cut off, and that the diagram employed for the sturdy warrior and similar figures is also an irregular form of the favourite pentagram.—(W.)



En ces-iiii-figures adefigures de
 lart de rometre-mais al conoistre
 couyent auoir qñc esgart & sauoir
 uelt de q̄ cascade touz ouuer

PLATE XXXVII.

VERSO OF THE NINETEENTH LEAF.

IN this plate we find a new class of drawings, in which many figures are so grouped and entangled as to confound their members together, and make the same member serve for two or more figures. Thus four men are arranged round a centre in such a manner that each viewed separately appears to have two legs, yet there are but four legs in the whole group. Each man lifts a hammer, and seems to be driving a nail into the foot of the man next in front of him. The whole machine is probably intended to revolve about its centre for the purpose of striking a bell. Machines of this kind are not uncommon in foreign churches. The hand or arm that carries the hammer of each figure would in that case be mounted on a pivot, so as to fall on the bell, and then escape from it as the wheel by its rotation carries it past its edge. The group of three fishes at the upper corner of the plate have but one head and one eye in common^m.

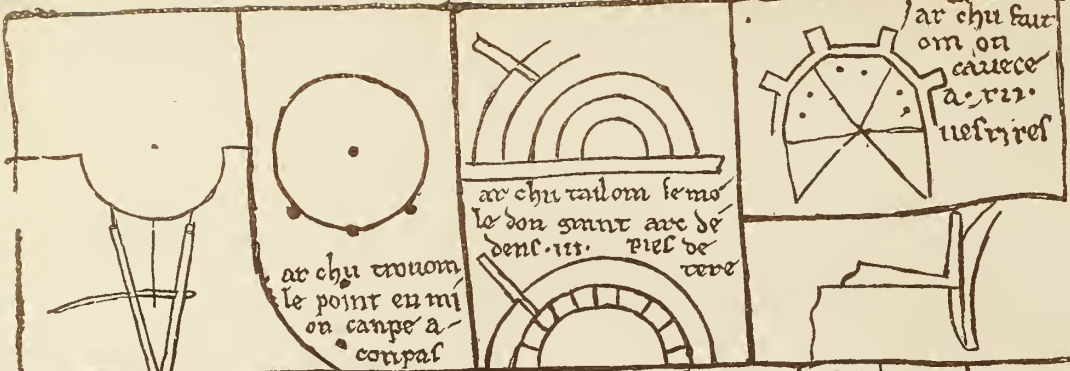
At the bottom of the page is a curiously ingenious group of figures, not completely filled up, but easy to finish from the indications given. If so completed, the design would exhibit eight figures with varied attitudes, yet symmetrically arranged about a centreⁿ. The whole is contained in a square divided into thirty-six smaller squares, and by diagonal lines for the purpose of directing the draughtsman. By the side of this a head and face are sketched upon a reticulation consisting of a square group of sixteen small squares with diagonals. Apparently these squares are introduced, not so much to supply a rule of proportion, as to enable the artist to draw the two halves of the head and face alike; just as in the previous example the squares would enable him, after drawing one figure, to place all the others symmetrically about the centre, and finally to make a copy on a larger. This, in fact, would be the modern mode of doing the same thing. The pig's head, with its triangle, belongs to the same class as the heads of the horse and man, the sheep and greyhound, on Plate 35. The final inscription of this page has been already examined under Plate 34.—(W.)

END OF THE ART OF PORTRAITURE.

^m M. Lassus observes that grotesque combinations of this class occur in several sculptures of the middle ages, especially at the doorway of the library at Rouen Cathedral. He quotes also the three combined legs which are the arms of Sicily, (and, it may be added, of the Isle of Man,) and remarks that the cylindrical helmet, with its two slits for vision, be-

longing to the middle of the thirteenth century, confirms the date of the manuscript already inferred from other evidence.

ⁿ The usual hieroglyphic head and face of Plate 35 serves to shew which way the figures are looking, and the same diagram is employed for the hammermen above.—(W.)



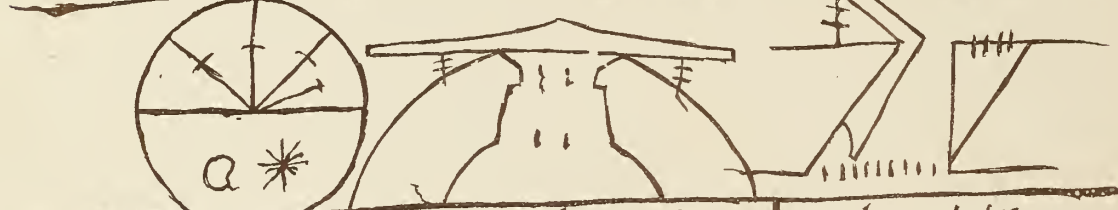
Par cu pre Om la grosse
dome colombe que on ne
voit mie tote

ar chu trouom
le point eu mi
on campe a
compas

ar chu uolom une arc le en
treel de vers le ciel

ar chu fait
om on
caucee
a . r . r .
ues tres

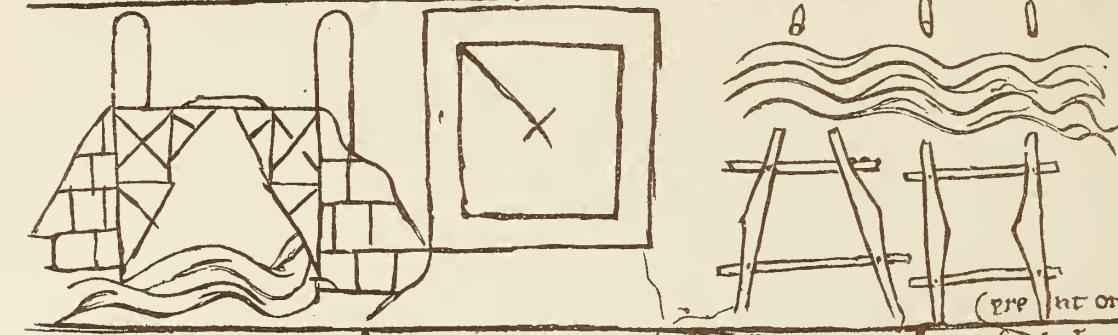
ar chu tail om
erracen mens



ar chu fait om cheyr
dent pires aun point
Si lous neleront

ar chu tail den uolure
bestor. de machonerye
ro on de

ar chu tail om
uolure belloge



ar chu fait om on
pont de loz onc aue
de sul de . r . r . piel s long .

ar chu fait om on clo
stre. autre tant el uoel
com el pra el

ar chu prent on
la laigece done
aue. sens passer

ar chu la tar
gece done senel
tre ki est loul .



ar chu allier am
les un coent don clo
stre seut plonc el senel
li uoel

ar chu parq som
one pirre que les un
moitel sont qveres.

ar chu torz rom.
se uyl don per soir

ar chu fait om
uallias. que li anl
uent. u. tant que li arcel



ar chu tail ore uolure ruzelo

touel cel figurel sunt
cstrucl de geometrie

THE GEOMETRY OF MASONRY.

PLATE XXXVIII.

RECTO OF THE TWENTIETH LEAF.

The paging added in the fifteenth century becomes confused at this point, for the book having been closed before the ink was dry, the characters written on this and the next page are so blotted as to make them illegible. This is, however, evident, that the literal paging is henceforward changed into an arithmetical one in Roman characters. Apparently the writer finding, when his alphabet had reached *v*, that it was nearly exhausted, determined to continue his paging in Roman numerals, by considering *v* to represent the number *five* instead of an alphabetical character, but has carried out his intention in a bungling manner.

This page and the two following are exclusively devoted to a series of diagrams representing various geometrical devices relating to construction, and for the most part to masonry. The inscription terms them geometrical,—“*Totes ces figures sunt estraites de geometrie.*” Under every diagram is a short and generally enigmatical legend which indicates its purpose, but in no case explains the artifice, and may consequently be as “a word to the wise,” for the learner may seek its meaning in vain. They appear to have no pretension to the constitution of a body of instruction, neither can they claim to shew the ordinary practice of the period; they seem rather to be a chance collection of expedients to meet particular cases which the author picked up here and there in the course of his travels, and noted, primarily for his own use, like the other drawings in his note-book, and lastly, has consigned them with the other contents of the volume to posterity.

The diagrams, with very few exceptions, are regularly ranged in rows upon the page, each row being bounded below by a border of two parallel lines, between which the legends descriptive of the purpose are written in compartments placed below their respective diagrams°. Notwithstanding this appearance of method,

1 . 2 . 3 . 5
4 . 6
7 . 8 . 9
10 . 11 . 12 . 13
14 . 15 . 16 . 17
18 . 19

This table, which exhibits the distinguishing numbers attached to the explanations which follow, being disposed in the same order as the figures to which they respectively apply in the plate, will assist in finding the diagram that belongs to each. Plate 39 contains the continuation of the series from 20 to 32, and Plate 40 its conclusion from 33 to 40. I have found it necessary to substitute new descriptions for all those which relate to the three plates on this subject in the French edition.—(W.)

there is no classification in the arrangement of the collection. Devices of the most puerile character for pastime alternate with stone-cutting, mensuration, and carpentry, as chance, the size of the diagram, or the order of acquisition may have determined.

1.

“Par ce prenum la grosse donc colonne que on ne voit mie tote.”

“How to take the diameter of a column of which only half is visible.”

This is a simple device, contrived to obtain the relative position of three points of the circumference of a horizontal section of the column. The two points of the ordinary mason's compasses are placed in contact with the surface of the column, and a piece of wire, applied to the curved bar by which the legs are kept in position, is pushed into contact with an intermediate point of the surface, and held by the fingers or tied fast, so that the compasses may be placed flat on a drawing-board, and the position of the three points accurately laid down.

2.

“Ar chu trovom le point en mi on canpe a compas^p.”

“Ainsi trouve-t-on le point au milieu d'un champ décrit au compas.”—(Quicherat.)

“How to find the point in the centre of a circular area.”

This, which is a continuation of the first, shews the three points laid down on the board, and the circular section of the column as duly described from the centre point obtained from them. M. Quicherat remarks that this figure “merely shews the solution obtained, without indicating the method, as it represents merely a circle, on the circumference of which are marked the three points, by means of which it was obtained. The problem was well known to practical masons^q under the name of the *trois points perdus*.” It appears in the earliest written books on the subject, such as Albert Durer's “Geometry,” and Philibert de Lorme's “Architecture,” (l. iii. c. 4).

The two points which are marked below the diagram seem to shew that a rougher method was employed at this earlier period. The lowest of these may be the intersecting point of the compass-legs, marked at the same time with three

^p *compas* is used for a segment of a circle at p. 45 above.

^q The construction is the same as that of Euclid's

equivalent problem, “To describe a circle about a given triangle,” (bk. iv. p. 5,) the points of the triangle being the three points given.

circumference points; the other is perhaps the place of the wire which is set in the middle of the iron bar. The intermediate point of the original three seems also to be carefully taken midway. Thus we are led to suppose that a diametrical line was drawn by help of two of these last-mentioned points^r, and the required centre found upon this line by trying different openings of the compasses, until one was hit upon that would draw the arc through the three points. This process, inelegant and uncertain as it may appear to be to a geometer, is, after all, sufficiently rapid in practice, and more consistent with the coarse methods employed even by modern artizans than the exact construction.—(W.)

~~~~~

3.

“Ar chu tail om le mole don grant arc dedens. III. pies de tere.”

“Par ce moyen taille-t-on le modèle d’un grand arc dans trois pieds de terre.”

“How to cut the mold of a great arch in a space of three feet.”

The mold, or pattern, which is used for shaping the faces of the voussoirs of an arch has necessarily the upper and lower edges formed of portions of the circular arcs that bound it above and below (technically termed the *extrados* and *intrados*); the sides of the mold must converge to the centre of the arc. This mold can be readily laid down by means of a long ruler, or even a stretched string, of the length of the radius of the circle, and attached to a pin in the place of the centre. But this supposes that the floor or place in which the drawing is, is large enough to contain the length of the radius. The problem enunciated above shews how to perform the operation in a very small workshop, and would in modern phraseology be termed a method of describing an arc of a circle or its radii when its centre is inaccessible<sup>s</sup>.

In this diagram the large arc appears to be obtained by scribing a series of arcs one from the other in succession. A complete semicircular mold, or templet, as it is called, is first made as large as the space allows of, and a guage-rod, or scribing-stick, is provided, with a broad-faced notch so formed as to enable it to rest or travel upon any part of the circumference of the semicircle with its edge always in the direction of its radius. If, for example, a tracing-point be attached to this rod, at a foot distance from the notch which touches the semicircle, and the rod be made to travel along the edge of it, the tracing-point will describe

<sup>r</sup> Perhaps the two lower points were obtained by setting off two pairs of intersections from the extreme circumference points, with equal radii respectively.

<sup>s</sup> For this purpose instruments are constructed which bear the names of Arcograph, Cyclograph, and

Centrolinead. Vide Trans. Soc. Arts, vols. xxxii., xxxiii., and xxxix., for the description of these contrivances by Messrs. Nicholson, Farey, and Rotch; also Peter Nicholson’s “New Practical Builder,” 1823, p. 562, &c.

an arc of a circle whose radius is a foot longer than that of the semicircle; and if the edge of this new arc be cut out so as to form a second templet, and the rod again travelled along its edge, an arc of larger radius will be obtained, and so on.

The same guage-rod may be used, as shewn in the diagram, for obtaining the direction of the lateral lines or joints of the voussoirs. The case in question would rarely, if ever, occur in practice, but, as I have already said, these problems must not be considered as shewing the ordinary methods in use by the cotemporaries of Wilars de Honecort, but rather expedients, or *tours de force*, for the exercise of ingenuity. M. Quicherat<sup>s</sup> explains the legend by supposing that it relates the execution of a clay model of the full size of one voussoir, which is to be used as a pattern for all the rest. His explanation is headed,—“*Exécution du modèle en terre avant de construire un arc.*” And the legend is then translated and interpreted thus:—“*Tailler le moule*” is to model in solid from the elevations and profiles, and thence to carve out a voussoir which, in accordance with the known properties of the semicircular arch, (which the author distinguishes by the name “*grand arc*”), may serve as a pattern for all the other voussoirs of the same arch. “*Dedans trois pieds de terre*” shews either the surface of ground, or the bulk required for the work. “It signifies little which of the two. Neither does it matter whether the *trois pieds* be an accurate measure, or an indefinite expression to signify a small quantity, or whether the three complete semicircles shewn below the segments which are produced by the operation are drawn to explain it, or for some other purpose, still the fact of the execution of a model in relief is put out of doubt.” Thus far M. Quicherat.

M. Lassus, on the other hand, is of opinion that the workshop must be supposed too small to contain a drawing of the whole arch on the full size. A drawing on a small scale is therefore made and divided into the convenient number of voussoirs; and then, in the remote corner of the workshop, a portion of the circumference, as large as the space will allow, of the full-sized arch, is drawn concentric to the small drawing. The radii of the small arch that represent the joints being produced to meet the large arch, will give the width of the voussoir, and the inclination of its sides. The guage applied to the arch in the drawing is, according to this explanation, employed to transfer the dimensions of the voussoir from the drawing to the stone.

<sup>s</sup> *Revue d'Archéologie*, p. 169. By some strange misunderstanding he refers to my own memoir on the vaults of the middle ages, (Transaction of British Architects, and Daly, *Revue d'Architecture*, 1843,) as corroborating his opinion:—“Il est digne de re-

marque q'un architecte anglais très versé dans la connaissance du gothique. M. Willis, en est venu, avec la seule ressource de ses observations, à conjecturer le même fait,” p. 169.

## 4.

“Ar chu vosom unc arc le cintrecl de vers le ciel.”

“Voici un arc, le cintre tourné vers le ciel.”

The meaning appears to be,—

“*This shews an arch, the centering of which is on the outer side.*”

The purpose of this diagram is very obscure. As mediæval arches are for the most part built in ranges of concentric voussoirs forming successive orders, a case may be conceived to occur in practice in which one of these arches may be required to be set beneath one already constructed, which would therefore serve as an outside centering to determine its form. But the voussoirs would require to be wedged up from below to sustain them<sup>t</sup>. The drawing appears intended as a memorandum of the process, whatever it be.—(W.)

## 5.

“Ar chu fait om on cavecc a XII vesrires.”

“Par ce moyen fait-on un chevet à douze verrières.”

“*How to make an apse with twelve windows.*”

In this singular diagram there is a polygonal apse with five sides in addition to two parallel sides; four buttresses are represented, and the walls of the five sides indicated, but not those of the parallel sides; neither is the junction of this apse with the remainder of the building indicated.

Vault-lines are shewn, but in a manner incompatible with the plan, because they spring from the wall at points which are not opposite to the buttresses. In fact, the five-sided apse is divided into three vaulting compartments. Two dots in each compartment near the wall may stand for pillars or window-jambs, or for the columns of an arcade below the windows. It is impossible to gather from this hasty figure the arrangement of twelve windows which the legend mentions as the characteristic of the plan. Lassus suggests the plausible interpretation that we should read VII. instead of XII., in which case a window in each of the five inclined faces, added to one in each of the side walls, would make up the number; the vault-lines must be supposed to be entirely wrong.—(W.)

<sup>t</sup> The engraving represents the arch as completely fitted with voussoirs, but in the manuscript one of the joint-lines is left out, namely, the fourth on the right side, so as to shew an unfinished arch, of which five voussoirs are set on one side, and three on the other, and two are wanting. M. Quicherat's woodcut represents it this way, and agrees with my own tracing,

which I should otherwise have suspected of error. M. Lassus thinks that the complete arch represents the one formed of the voussoirs traced by the previous process. The gauge-stick is to be set in coincidence with the joints of this arch in order to describe those of the outer one.—(W.)

## 6.

“Ar chu tail om erracemmens.”

“Par ce moyen taille-t-on les sommiers (arrachemens) de voûte.”

“Thus are shaped the first, or springing stones of a vault, or arch.”

The first stones of an arch-vault are to this day called “arrachemens” by French masons, and the purpose of this diagram is merely to shew how to trace the soffit. In fig. 7,  $A B C A'''$  is the head, or vertical side, of such a stone, in which  $B C$  is the edge of the soffit. The lower bed  $A'''C$  is necessarily horizontal, and in mediæval vaults, and sometimes in the arches, the

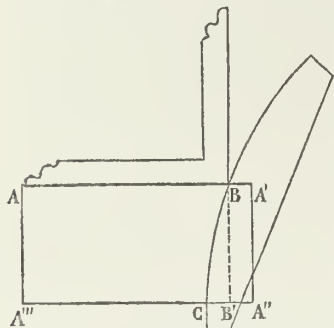


Figure 7.

upper bed is also horizontal. Manifestly the upper extremity  $B$  of the soffit overhangs the lower extremity  $C$ , and if a perpendicular  $B B'$  be let fall from the top,  $B' C$  will measure the overhang. If a mason's square be placed on the upper bed of the stone, and a straight-edge be employed to continue the perpendicular  $B B'$  from its upright leg, the point  $C$  can be marked by setting off the distance  $B' C$  obtained from the working drawings. A camber-slip, or sweep, whose edge is

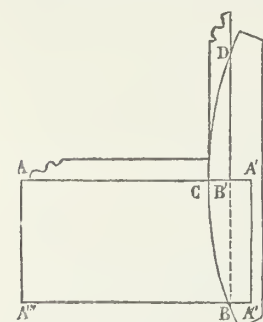


Figure 8.

shaped to the curvature of the soffit, being placed with that edge in contact with the two points  $B$  and  $C$ , enables the curve to be traced.

This explanation differs from that given by Wilars only in the position of the stone, which in our diagram is placed in its true position, as easier to understand, but in his is inverted (as in fig. 8), and therefore enables the process to be performed, whether the upper bed be horizontal, or like that of a modern voussoir, inclined towards the centre of the arch, as indeed is the case in most of the mediæval arches. As he has not drawn this upper bed in its inverted position, it is clear he thought its form

of no consequence.—(W.)

## 7.

“Ar chu fait om cheir deus pires a un point si lons ne seront.”

“Par ce moyen fait-on arriver deux pierres à un point, si elles ne sont pas éloignées.”

“By this means two stones can be brought to the same point, if they are not far distant.”

Both Quieherat and Lassus declare this diagram to be wholly inexplicable. The

<sup>2</sup> The diagrams are given by Lassus, and his explanation is essentially the same as that which I have given.—(W.)

former, by classing it with one in Plate 40 which shews how to make a pear fall on an egg, evidently imagines that this relates to a similar trick. It seems to me to belong to masonry, and to be some artifice for guiding the stones of a large column into their proper places as they are being lowered for setting. Considering the very simple devices that are thought worth recording in this collection, I should even venture to suggest that the whole affair relates to making corresponding marks upon the edges of two stones that are to be in contact, so as to guide the setters in placing them. The figure, in this view of the question, represents the plan of a circular shaft built of radiating stones, of which the joints tend to the centre-point. To set the stones so that they shall all tend to this point is the meaning of the legend. Three of the joint lines are crossed with a short line which represents the two guide-marks in contact. The short radial line on the left must be a perspective view of an upright pin stuck in the centre; the two characters below are masons' marks.—(W.)

## 8.

“Ar chu tail om vosure destor<sup>v</sup> de machonerie roonde.”

“Par ce moyen taille-t-on une voussure<sup>x</sup>, de fenêtre en maçonnerie ronde.”

“Thus is cut the voussoir<sup>x</sup> (of a window) in a building of circular masonry.”

M. Quicherat understands by *vosure d'estor* the rib of a vault garnished with mouldings, and by *machonerie roonde* the curvature of the rib, and thus interprets the figure to represent two sections of mouldings placed in opposite directions<sup>y</sup>. This view can hardly be accepted, for the drawing clearly represents the plan of the window of a round tower, as Lassus interprets it. A straight-edge is placed horizontally across the opening, and at equal distances from the jambs on each side are set-off lines with divisions upon them, which in these drawings usually indicate measurements, and here serve to shew the deviation of the curved face of the stone from that of a plane wall. Lassus suggests that the two stones represented must have been wrought in the workshops, and that the marks in question are intended to guide the setters.

The above explanation applies only to the jamb-stones, for the voussoirs of the arched head of a window in a circular wall have each of them a different deviation according to their distance from the keystone, and this of so complex a

<sup>v</sup> Perhaps from *estorer*, créer, construire, bâtir, &c., *instaurare* (Roquefort), or from *tor*, a tower.—(W.)

<sup>x</sup> It must be observed that the word *voussoir* is in the manuscript spelt *vosoir*, *vosor* and *vosure*, indifferently, and that there is consequently no reason

for translating it *vousure*, or *vaulting*, in the present instance. Vide, for example, fig. 4 in Plate 40, where the *vosure* is an unmistakable voussoir, or arch-stone.—(W.)

<sup>y</sup> *Revue*, p. 170.

nature, that considering the small stones employed in the middle ages, we must conclude that the heads of the voussoirs were first worked as if they were intended for an arch in a plane wall, and that after being set in position their surfaces were wrought into coincidence with the general curvature of the wall. It may be fairly conjectured that the word *vosure* included jamb-stones, as well as its modern sense of arch-stones; yet the figures at the bottom of this plate, which evidently belong to the same class as the one under consideration, incontestably appertain to arch-stones.—(W.)

## 9.

“Ar chu tail om vosure besloge<sup>z</sup>.”

“Par ce moyen taille-t-on vousure oblique.”

“In this way is cut a skew voussoir.”

From this figure and others it is evident that the useful instrument termed a bevel, or jointed square, which can be set to any angle, was not known to the cotemporaries of Wilars de Honecort. No trace of it is to be found in his sketches, and in all cases that appear to call for its application, as in the present figure, the angle is indicated by measuring the triangle by which it differs from a right angle, or by cutting a triangular board to serve as a mold or pattern<sup>a</sup>. The present figure shews a plan of an oblique passage through a wall. The acute angle on the left hand, which would now be taken with a bevel for the guidance of a mason in working the jamb-stones, is ascertained by applying the inside of a square, and measuring the length of the perpendicular distance from its extremity to the surface. The obtuse angle on the opposite side is ascertained by applying the square with one leg in the direction of the face of the wall, and the other consequently perpendicular to it, and then measuring the distance from the inner angle of the square to the obtuse edge of the jamb<sup>b</sup>. By these measures the angles can be transferred to the stone.—(W.)

<sup>z</sup> M. Quicherat observes that the word *besloge* by its analogy with *balonge*, or *berlonge*, which are different forms of the old adjective *barlong*, must bear the same meaning.

<sup>a</sup> Vide No. 28 below.

<sup>b</sup> Quicherat suggests that the figure belongs to the voussoirs of a vault-rib in an oblique direction, “*taille des voussoirs d’une nervure biaisée*,” without farther explanation. Lassus, on the other hand, gives a totally different interpretation, in which I cannot concur, but which, as others may be of another opinion, I subjoin in the words of the writer:—“As the two outer or visible surfaces of the wall or vault must be parallel,

the method here given of obtaining this parallelism

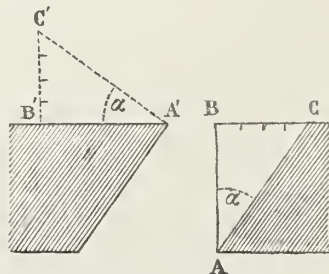


Figure 9.

is the most simple conceivable. A right-angled tri-

## 10.

“ Par chu fait om on pont de sor one aive de fus de xx pies de lonc.”

“ Par ce fait-on un pont sur une cau de bois de vingt pieds de long.”

“ *This is the way to make a bridge over a river of wood of twenty feet in length.*”

This ambiguous description, which leaves us in doubt whether the twenty feet belong to the river, the bridge, or the individual pieces of timber, having been taken by Quicherat in the first sense, he exclaims in astonishment that it is incredible to behold the number of pieces employed in a bridge of so small a span. But Lassus more practically adopts the latter appropriation, which gives the problem the form of “How to make a bridge over a river of about fifty feet in breadth, with timbers of only twenty feet in length?” Two lofty piers of masonry are erected, between which the frame of carpentry is set up. It is probably exaggerated in its proportional height. The framing is indicated by lines only, but explains itself. The roadway has apparently a gateway-arch at each end to bar the passage at pleasure.—(W.)

## 11.

“ Ar chu fait om on clostre, autretant es voies com el prael.”

“ Par ce moyen trace-t-on un cloître avec ses galeries et son préau.”

“ *Thus a cloister may be laid out, with its deambulatories and garth.*”

The dimensions of the proposed cloister must be supposed to be given, and the position of one of the sides. The diagram appears to correspond to the following well-known process. Set a stake C in the ground nearly opposite the centre of the side A B, of which the position and length are given, and about half-way across; the exact position of the stake is of no consequence. The diagonal A C, drawn from C to the left hand upper corner of the square, represents a rod or a string stretched to the exact distance. Carry the upper extremity of the string round, so as to trace a circle D A E, intersecting the given side A B in a point D. Draw a straight line through D C, and

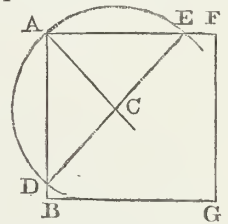


Figure 10.

angle A B C, whose base B C includes a certain number of divisions, is described upon the right hand voussoir. If now a square be applied against the left face (of the oblique opening, in the manner shewn in Honecort's figure), the angle  $\alpha$  which it makes with the bare wall will be equal to the angle  $\alpha$  at A, the apex of the first triangle. Thus by measuring between the wall and the leg of the square a distance B' C' equal to the base B C of the first triangle, the leg which touches the soffit of the voussoir will be

in a direction parallel to the other face. But the distance B' C' must be exactly normal to the wall, and taken at a distance A' B', from the arris A' of the oblique opening equal to the thickness A B of the wall or voussoir, so as to make the two triangles A B C, A' B' C', equal." The figure can hardly be supposed to apply to an oblique arch, for the angle which the face of the wall makes with the soffit of such an arch varies at every point, unless it be taken in a horizontal plane.—(W.)

produce it to meet the circle in E. The line A E F will be perpendicular to D A, and the length of the side A F must be set off upon it. The other sides are easily set off by lines F G, B G, respectively equal to their opposite sides, meeting at G. This elementary process, which is one of those given by De Lorme for this very purpose, is so well known that I should scarcely have ventured to detail it, except to shew its perfect accordance with the diagram<sup>e</sup>.—(W.)

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12.

“Ar chu prent on la largece done aive. sens paseir.”

“Par ce moyen prend-on la largeur d’une eau sans la passer.”

“*Thus is measured the breadth of a stream without crossing it.*”

“Some object being chosen on the far bank of the stream, the operation is performed on the near bank by an instrument composed of two rulers, and two transverse and parallel bars which lie beneath them; each ruler is in turn fixed to the bars with its edge directed towards the chosen object, by taking a sight along that edge.

“The whole frame is then transported to the nearest convenient field, and the position of the point at which the directions of the edges intersect ascertained and marked. This point will be at the same distance from the instrument as the chosen object was in the first position of the apparatus, therefore by direct measurement that distance will be obtained. Apart from the rudeness of the operation, it has the disadvantage of deducing long distances from a very short base.”—(L.)

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13.

“Ar chu prent om la largece done fenestre ki est lons.”

“Par ce moyen, prend-on la largeur d’une fenêtre qui est éloignée.”

“*Thus is measured the breadth of a distant window, or other opening.*”

The same instrument is employed which was used in the previous operation,

\* Quichrat abandons this diagram as inexplicable. Lassus says that “the method indicated consists simply in verifying the fact that the angles of the quadrilateral figure which forms the trace of the plan are at equal distances from its centre, in which case the quadrilateral will be a square. After having fixed the length and the position of one of the sides of the cloister, its centre must be determined, if not

already fixed. In the next place, after tracing the three other sides at right angles, the process is verified by trying if the four semidiagonals from the centre are equal. The determination of the directions of the sides and position of the centre are obtained by laying down perpendiculars in a manner which Wilars de Honcort explains below.—(L.)”



but the two rulers are fixed parallel to each other. The edge of one being directed to the left-hand side of the distant opening to be measured, and the edge of the other to its right-hand side, the distance between the rulers will be equal to the distance between the two sides of the opening. To prevent mistakes concerning the sides of the rulers that have been employed in taking the sights, Wilars de Honecort is careful to shew that each ruler has but one straight edge.—(L.)

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14.

“Ar chu assiet am les .IIII. coens don clostre sens plonc es sens linel.”

“Par ce moyen asseoit-on les quatre coins d’un cloître sans plomb et sans ligne.”

“Thus may be set the four corner-stones of a cloister without plummet or level<sup>d</sup>.”

The four objects delineated seem to represent the four stones on a greatly exaggerated scale. Each stone is dressed on its upper and lower face, and worked square on the two sides only which are turned towards the ambulatory, the other two sides are left rough to be built into the thickness of the wall. A diagonal line is marked on the upper surface of each, in which the whole artifice consists. Four posts are indicated by the black points on the outside of the diagram. These must have been set in position at the outer angles of the square traced by the previous operation described in No. 11, and the centre of the square is marked by a cross. The stones having been set down with their angles coinciding with the previously marked points at the corners of the ambulatory, are adjusted in position by placing the diagonal lines traced on their surface in coincidence with strings stretched diagonally across the area from the corner-posts, or perhaps by taking a sight from each stone along its diagonal line to the opposite corner-post. The operation may be verified by stretching lines or taking sights along the lateral faces of the stones from each corner to the next.

The operation of placing the stones with their surfaces all at the same level, cannot be performed without some kind of levelling instrument, although if one of them were set with its surface truly level to begin with, the others might be roughly set at the same level by strings or sights from the first. Such a process seems to be hinted at in the legend. I have suggested the taking of sights, which of course would be done by the help of a straight-edge, because this diagram immediately follows one in which this method is employed.

<sup>d</sup> M. Quicherat reads the legend, “assiet om..... veau.” In my copy of the manuscript I find, “assiet sens plonc et sens livel.....sans plomb et sans ni- om.....sens plons et sens livel.”

Both Quicherat and Lassus suppose that the objects at each corner, which I have viewed as the actual corner-stones, are boards carefully squared, and having the diagonal line drawn upon their surfaces; the latter ingeniously explains the object of the process to be to determine the four corner-points of the square area without any other instruments than these boards:—"A line representing one side of the required area being laid down upon the ground, one of these boards is

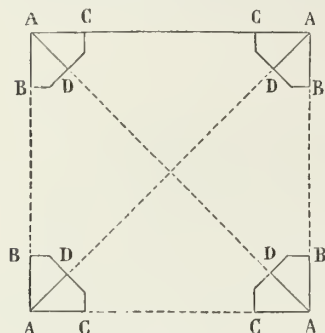


Figure 11.

placed at each end, with its angle A coinciding with the extremity, and its side A C with the direction, of the line. The other two boards are carried to the opposite side, and each one is placed in such a position that its side A B will coincide with the prolongation of the side A B of the previously fixed opposite board, and also that its diagonal line A D will coincide with the similar line of the other previously fixed board at the opposite end of the diagonal. The rectangle thus obtained will be a true square; the four points marked as the prolongation of the diagonals at equal distances from the corners of the boards merely mark the angles of the ambulatories.—(L.)” Quicherat well observes that such proceedings as we are now considering must lead to inaccurate results, but that the want of precision in the directions and positions of the parts of ancient buildings shew that such loose methods must have been employed in setting them out<sup>e</sup>.—(W.)

## 15.

“Ar chu partis om one pirre que les .ii. moities sont a queres.”

“Par ce moyen divise-t-on une pierre de telles façon que ses deux moitiés soient carrées.”

“How to divide a stone so that its two halves shall each be square.”

The figure itself shews the real meaning of the problem to be, “How to divide one square slab into two square slabs<sup>f</sup>.”

The corners of the original slab being cut off in the direction of lines which join diagonally the middle points of its sides, a smaller square is obtained; if the four triangular pieces which were cut off be put together with their right angles

<sup>e</sup> *Revue*, p. 167.

<sup>f</sup> This is a deduction from the problem given by Vitruvius, b. ix. c. 1, under the name of Plato's

mode of doubling a square, which being contained in this author, is shewn to belong to the architects.—(W.)

in contact, a second square will be produced exactly equal to the first. In the figure, the diagonals of the inner square are merely drawn to make this result evident.—(L.)

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16.

“Ar chu tor tom le vis don persoir.”

“Par ce moyen tourne-t-on la vis d’un pressoir.”

“*Thus is turned (or carved) the screw of a press.*”

The circle is the plan of a wooden cylinder which has been prepared in the turning lathe, and the diagram is intended to explain the method of tracing the spiral line which is to guide the workman in hollowing out the groove which is to convert the cylinder into a screw. A ruler is notched at equal distances corresponding to the pitch of the intended screw, that is to say, to the distance between the turns of the spiral. Three lines are drawn on the surface of the cylinder parallel to its axis, and at three equidistant points of its circumference indicated in the figure. These lines are to be divided into equal spaces by the help of the saw-shaped ruler, observing that the divisions on the lines are not all at the same level, but on each raised a space of one-third of the pitch higher than on the one next behind it. The points thus obtained on the surface of the cylinder lie in the path of a regular spiral, and serve to guide the workman in winding the string shewn in the figure regularly round its surface. By help of this string a continuous line is then traced, and a groove subsequently sunk by means of carving tools so as to complete the screw.

This is a well-known process, and is even now partly resorted to in some cases for the production of original screws<sup>8</sup>. The figure, like all the others in this page, is a mere memorandum for the use of a person who had seen the process, and shews how much remains to be supplied in the attempt to explain the other diagrams.

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17.

“Ar chu fait om .ii. vassias. que li ons tient .ii. tans que li atres.”

“Par ce, fait on deux vaisseaux tels que l’un tieme deux fois autant que l’autre.”

“*How to make two vessels so that one shall hold twice as much as the other.*”

The vessels must be supposed cylindrical, and the circle in the diagram to be the plan of the smaller of the two; a mason’s square is carried round the outside

<sup>8</sup> Vide Holtzapffel’s “Mechanical Manipulation,” vol. ii. p. 580.

of the vessel, with its two branches in contact with it, while a pencil in the angle describes a larger circle. The area of this large circle can be easily shewn to be double that of the small one<sup>b</sup>, because its radius is the hypotenuse of a right-angled triangle whose smaller sides are each equal to the radius of the small circle. If the two vessels are the same height, the one will have double the capacity of the other<sup>i</sup>. This principle will not apply to vessels of other forms, as spherical or hemispherical, because the capacities of similar figures vary as the cubes of their similar lines.

The explanations given by Quicherat, and after him by Lassus, are in principle the same as the above, but neither of them have noticed the marks on the area of the circle, and beyond it to the left of its centre, the explanation of which appears to be as follows.

If the two vessels are to be exactly similar in form, instead of being of the same height, the cube of the radius of the large vessel must be double the cube of the smaller radius; therefore the large radius is to the small radius in the proportion of the cube root of two to unity. This is very nearly in the proportion of one and a-quarter to one<sup>j</sup>. If, therefore, we increase the radius of the small vessel by a quarter, we obtain the large radius; and to do this is the object of the marks on the left of the centre. Of the two marks within the circle, the first bisects the radius, the second bisects the half so obtained, and gives the quarter. This quarter is transferred to the outside, and the arc drawn concentric to the smaller circle is the resulting circumference of the larger vessel.—(W.)

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18, 19.

“ Ar chu tail on vosure riuleic^k.”

“ Par ce moyen taille-t-on une voussure réglée.”

“ *How to cut a voussoir according to rule.*”

The plan (No. 18) is that of an ordinary mediæval window with the jambs splayed inwards. The figure (No. 19) on the right hand shews the heads of two arch-stones or voussoirs, of which possibly the left-hand one may belong to the external arch of the window-head, the other to the inward or scoinson arch, which is of greater span. These are laid on a flat surface at distances from a

^b For as the areas of circles are in the proportion of the squares of their radii, the square of the large radius must be double the square of the small one.

ⁱ This will also be the case if the vessels be frusta of cones and of the same height, provided their bases and their tops bear respectively the above-described

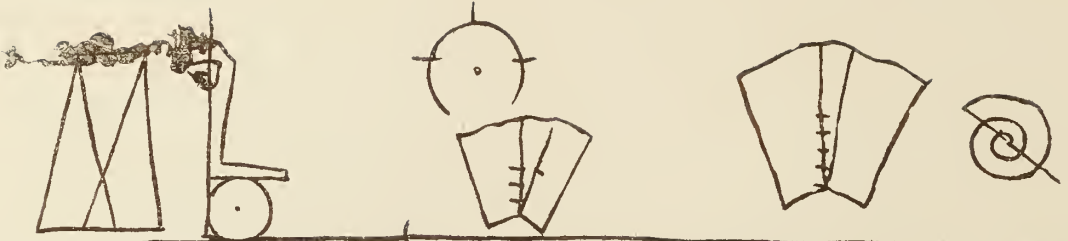
proportions.

^j The real ratio is 1.26 to 1, which differs from one and a-quarter only by one-hundredth part of the radius.

^k RIEULÉ : exact, soumis à la règle, regulier. (Roquefort).

common point (not marked in the drawing), respectively equal to the radii of the arches to which they belong. Thus the two upper sides or joint lines in the drawing are in one straight line, shewn by the cord stretched from one to the other. The same cord if fixed to the centre point, and applied to the lower joint-lines, at distances from the upper, respectively equal to the breadth of the soffit of a voussoir, will enable those lines to be drawn at the proper angle; and a tracing-point attached to it would enable the curves of the upper and lower surfaces to be drawn. It must be observed that whether an arch be large or small, the breadth of the voussoir will be the same in mediæval architecture. In these drawings the breadth taken on the soffit-line is marked at four divisions in each, to shew that the two soffits are equal.

This is in substance the explanation given by Lassus, excepting that he has represented the divisions on the soffit-lines to be unequal in the two figures, and proportional to the radii of the respective soffits. If the process were intended for a conical vault constructed of long voussoirs extending from the outer to the inner face of the wall, the same disposition would give the tracing of the outer and inner head of each voussoir. But the mold in fig. 19 which is farthest from the centre would be proportionably larger than the other, and the two lower joints would coincide in direction as well as the upper.—(W.)

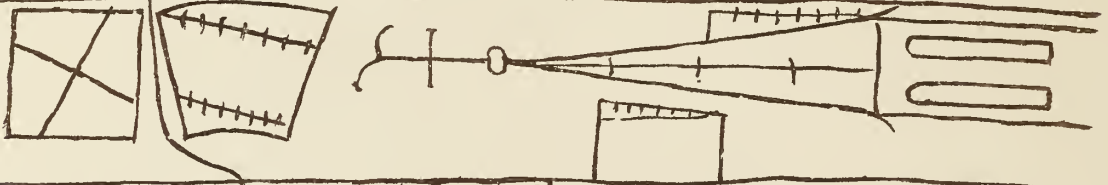


Par chu tail on peut
dans ruelles. mais
le bas el haut.

En si prendel on
roonde. en on
agle sen ares le
crois

Par chu fait on one
clef del tyre. yust
ce one loere.

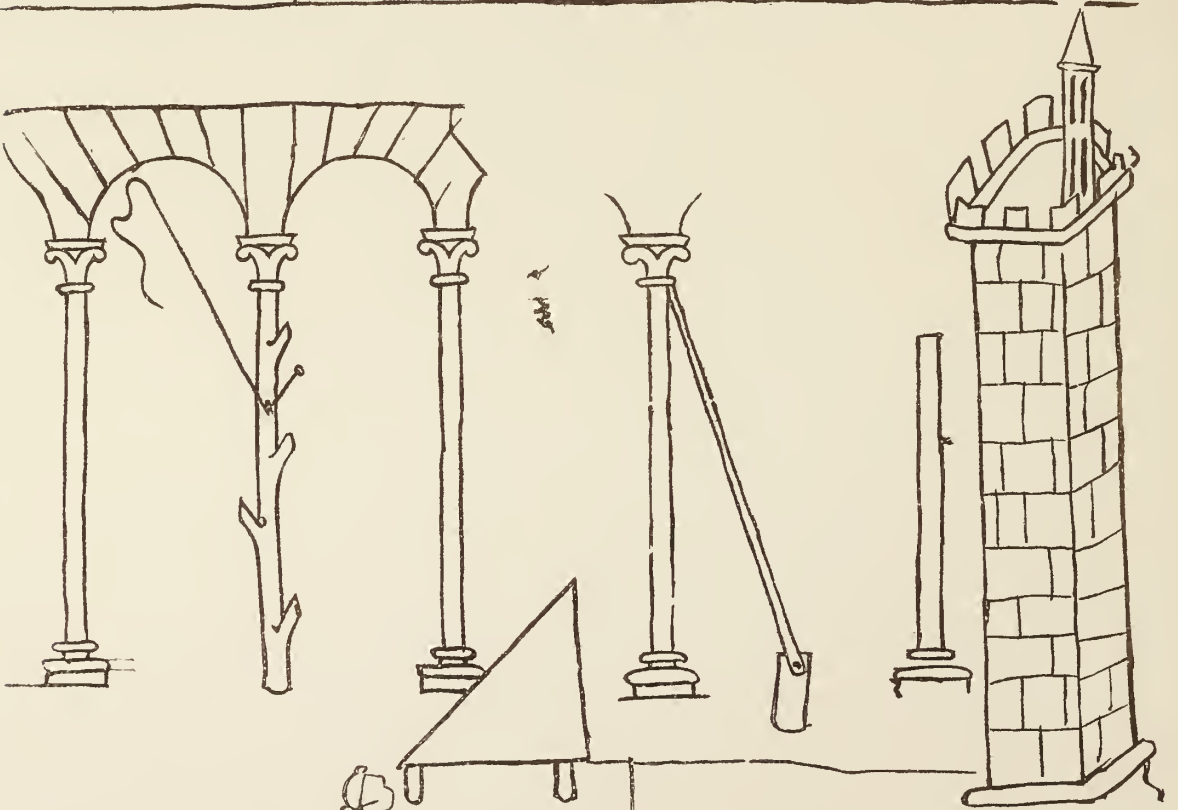
Par chu tail on one
clef del quint poine



Par chu fait on on pi
ler de quatre cunys
venir aloison

Par chu tail on volent
par effcandelon

Par ceste rasyon monton la guyle
done rooz. 2 taille les moles.



Par chu tail on
nosure pen-
dant

pa chu p n
tom. le haute
ce done rooz

Par chu monton
doul pilers done
haute ce sens plora. 2 sens huet

PLATE XXXIX.

VERSO OF THE TWENTIETH LEAF.

As this leaf and the following contain diagrams in continuation of the same subject as those on the last leaf, I have continued the numbering of them for the sake of reference¹.

20.

“Par chu tail om pendans riules, metes le bas el haut.”

“Par ce moyen taille-t-on pendants réglés : mettez le haut en bas.”

“In this way are cut pendants according to rule. Turn the figure upside down.”

Upon this diagram M. Quicherat remarks that “pendant” is the name given to the voussoirs that compose the vaulting surfaces that rest upon the ribs of a mediæval vault, and that these being so small and so thin, there is no need to make them with curved soffits like the voussoirs of a rib or arch, but their soffits may be flat, (and, still more, their extrados, or outer surface, which is out of sight^m). The angles of their joints require as little care, for the mason can provide for them at the moment of setting by a few strokes of the axe or the addition of a little mortar. But Lassus sees in the diagram an elaborate method of cutting the surfaces of the joints to their required angles, which I shall give in his own words in a noteⁿ.

20	21	22	24	25
		23		
26	27		28	
			29	
30	31	32		

This table shews the order of the numbers of reference employed in the explanations of the diagram, in this plate.

^m Frezier (*Traité de Stereotomie*, l. iv. part ii. c. 1) has some remarks on the “Voutes d’Arêtes Gothiques” to the same purpose, in which he gives the term *Pendantif* to their vault surfaces, and *Pandans* to the voussoirs of which they are built:—“On se contente ordinairement de les faire de petites pierres, sans coupe, qu’ou appelle *Pandans*, pour lesquelles le mortier mis un peu plus epais à l’extrados qu’à la doëlle fait l’office de la coupe d’un voussoir.”—(W.)

ⁿ “When the figure is inverted, in accordance with the legeud, we recognise the plau of the head of a voussoir, ou which has been traced parallel to each of the joints (A C, A’ C’) a liue (A’ B and A’ B’) from the juucliou of the opposite joint with the soffit. These lines intersect, and leave between the points B B’ where they meet the upper surface a distance B B’, which is greater or

less according as the angle of the joints is more or less obtuse. (Throughout this explanation the width

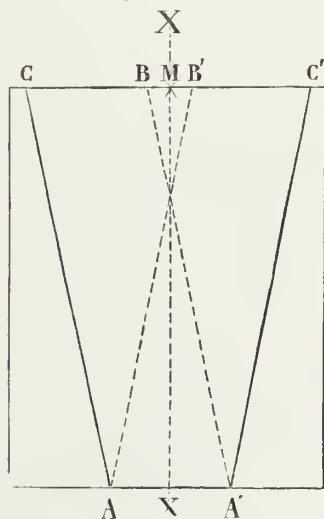


Figure 12.

A A’ of the soffit is supposed to be the same in all

The drawing may possibly represent the head of a voussoir, upon which is placed a triangular pattern which serves as a simple bevel to trace the angles which the joints make with the soffit. This pattern is shewn in two positions, namely, as applied first to one joint, and, secondly, to the other. As in these small voussoirs the upper surface or extrados is flat, the use of such an instrument is practicable, and the curvature of each course is so small that the angle of the joints would not vary sensibly, although the width of the soffit might be different in the different voussoirs; for this kind of vaulting does not require precision, from its thinness, and the fact that the mortar fills up the errors of the joints^o.—(W.)

the voussoirs, and also the thickness (M X) of them all to be constant.) Now the several courses of voussoirs in this class of vaults differ in curvature, one representing an arch of greater radius, and another of lesser radius, according to the shape given to the vaulting surface by the ribs upon which it rests. As the two joints of each voussoir converge to the centre of the circular arch to which it belongs, it follows that the angle between the joints, and consequently the distance B B', will be the same throughout each course, but will vary in the different courses. Moreover, the breadth of the lower soffit will be the same in all the courses, as well as the height of the voussoir, but the breadth of the upper surface, or extrados, will vary from one course to another. The master-mason will, therefore, after having traced the working drawing of his vault, and the section of each course of the voussoirs of the vaulting surface, deduce the distance B B' from each course, and give it to the stone-cutter expressed, for example, in inches. The latter will mark, on a block of stone already roughed out to the proper dimensions, the soffit A A' and the centre M of the extrados, and set off the given distance B B', join B A' and B' A, and, finally, draw C A and C' A' respectively parallel to the latter."

The only objection to this elaborate process appears to be its total uselessness, for as the width of the soffit is assumed to be the same throughout each course, and the width of the extrados C C' also the same in any one course, it is much simpler to set off the latter width at once and join C A C' A', than to begin with the small interval B B'.

But as the curvature of these courses is very small, the angle of the joints would not vary sensibly, supposing the soffit not to be exactly of the same breadth in

every voussoir. The method indicated by Lassus might have been employed to enable the angle to be set off by workmen who had no knowledge of the bevel, but in such cases the base C B' of the triangle would probably have been the distance chosen, and not the interval B B', which is too small for practical use.

^o The late M. von Lassaulx, of Coblenz, was the first to direct attention to the construction of these pendentive surfaces of the mediæval vaults. His memoir in Crelles' *Baujournal*. Berlin, 1829, was translated and inserted in the Journal of the Royal Institution, (vol. i. p. 224, London, 1831.) He shewed that the slight curvature of their surfaces and their irregularity, proved them to have been laid *free-handed*, without centering, as each course forms a small arch of itself, and will stand as soon as it is completed. The adhesion of each small voussoir to the layer of mortar is sufficient to prevent the sliding of the stone before the termination of the course, or if not, may be assisted by some rough contrivance.

M. Viollet-le-Duc has lately given, in his excellent "Dictionary of Architecture," (t. iv. p. 105,) the results of his observations upon this subject, and explained the simple method which appears to have been used in the Isle of France and Champagne, and which he has restored and employed. He, like M. von Lassaulx, states that he has found no difficulty in introducing the method into practice. An adroit mason, assisted by a boy to supply him with the stones and mortar, is able to complete the vaulting surface without centres or any other apparatus than his axe and a wooden sweep cut to the required curvature.—(W.)

21.

“En si prendes one roonde. en on agle sen arez le grosc.”

“Ainsi prenez une rondeur dans un angle et vous en aurez la dimension.”

“*By thus placing any round thing in a nook, we obtain its diameter.*”

The figure explains itself. It may be supposed to represent a column placed in a nook, but the same mode of measuring diameters is applicable to any loose cylinder set up for the occasion in a square corner of a room, or laid down between the floor and the wall. A mason's square has one leg in contact with one of the flat surfaces, and the other with the cylinder. The perpendicular distance between the extremity of the latter leg and the flat surface opposite to it, and to which it is necessarily parallel, is equal to the diameter of the cylinder.

 22, 23.

“Par chu fait on one clef del tiere. et justice one scere.”

“Par ce moyen fait-on une clef de tiers-point, et vérifie-t-on un trait d'équerre.”

“*Thus may be traced the key-stone of an arch of the third point, and a square be adjusted.*”

These two clauses I consider to be independent of each other; the last belongs to the upper figure, No. 22, the first to the lower figure, No. 23. The adjustment of the square must be first explained, and the discussion of the other figure then taken in conjunction with the similar figure, No. 24.

The first appears to be intended for the following method of describing a right angle, and is here introduced for the purpose of verifying a mason's square. Fix the compasses to a convenient distance, and with that first trace a circle, and then upon its circumference set off four points in succession, of which only the first, second, and fourth should be strongly marked. Manifestly the first and fourth are at the extremities of a diameter, and as every angle in a semicircle is a right angle, it follows that if the square be laid down on the board with its angle in contact with the third or intermediate point, and one of its legs in contact with the first point, the other leg will be found in contact with the fourth point if the square be a true one. In the diagram the three points are carelessly marked at nearly equal distances, but this kind of inaccuracy is visible in all the geometrical figures of the manuscript.—(W.)

24.

“ Par chu tail on one clef del quint point.”

“ Par ce moyen taille-t-on une clef de quint-point.”

“ Thus may be traced the key-stone of an arch of the fifth point.”

Before these diagrams can be understood, it is necessary to determine the exact meaning of the terms ‘arch of the third point,’ and of the ‘fifth point.’

The terms *tiers-point*, *quint-point*, &c., in French, and the similar ones, ‘arch of the third point,’ or ‘fourth point’ in English, and *terzo acuto* and *quarto acuto* in Italian, belong to the ages when pointed architecture was practised, and have descended to us with no very clear definitions of their meaning. In France, the term *tiers-point* is now used by workmen, as Quicherat says, for the apex of an equilateral triangle, and hence is also applied to the equilateral Gothic arch, namely, that in which the centre of each side coincides with the opposite springing; and he goes on to conclude that in the middle ages this term was a general one for pointed arches. We shall also see that Lassus was in doubt as to the original sense of the word. In England, Sir Henry Wotton is the earliest writer who alludes to these terms. In his “Elements of Architecture,” 1624, he says:—“As for those *Arches* which our Artizans call of the third and fourth point; And the *Tuscan* writers *di terzo* and *di quarto acuto*, because they alwayes concur in an acute *Angle*, and doe spring from diuision of the *Diameter*, into three, foure, or more parts at pleasure; I say, such as these, both for the naturall imbecility of the sharpe *Angle* it selfe, and likewise for their very *Vncomelinesse*, ought to bee exiled from judicious eyes, and left to their first inuentors, the *Gothes* or *Lumbards*, amongst other *Reliques* of that barbarous *Age*.”—(p. 51.)

This passage leaves us in ambiguity with respect to the exact application of the division of the diameter, although it clearly shews the origin of the names. The most explicit account of these constructions that I have met with is in Philibert de Lorme’s *Nouvelles inventions pour bien bastir*, Paris, 1578. The object of this book is to explain the construction of a roof of his invention, the frame of which is wholly constructed of very short pieces of timber. Its outer surface is cylindrical, and therefore difficult to cover with flat tiles or slates, especially in the case of small spans.

To facilitate the employment of these materials, he recommends a pointed arch to be used instead of the semicircular arch, and teaches “comme l’on peut faire couvertures de diverses montees tant de l’hemicycle que *du tiers point et autres . . .*” In the chapter so headed, he first shews how to manage the semi-

circular covering by employing half slates, but states that those who prefer whole slates or tiles may reduce the curvature by using the *tiers-point*,—which may be seen in the window-frames of “modern” churches,—to describe which the span must be divided into three equal parts, of which two are to be taken for the radius of the arch, and the compasses set with one point on one of the divisions, and the other at the extremity of the span-line, and so on. But if the roof is to be made higher and with less curvature, then the span may be divided into four parts, and three of these taken for the radius. Or if it is to be made as high as some carpenters are accustomed to form their roofs, then the radius must be made equal to the span, so that if straight lines be drawn from the extremities of the span to the apex of the roof, they will form, together with the span-line, an equilateral triangle. The original chapter is so diffuse, that I have been compelled to abridge it °.

This passage, which has escaped the notice of the French editors of Wilars de Honcourt, supplies a clear description of the *arc en tiers-point*. As in the title of the chapter he mentions in order, the semicircle, the third point, *and others*, we may fairly assume that by others he means fourth point, fifth point, &c., and the equilateral, confining, that is to say, the term *tiers-point* to the arch in which the centre is obtained by a division into three, and not using it as a general term for pointed arches. The four examples which he has given explicitly, are the semicircle, third point, fourth point, and equilateral, which form a series of the same span, but gradually rising in height^p.

It is curious to find that Lassus, in commenting upon the diagrams in question

° “Qui voudra ne faut que tirer la montee au lieu d’un hemicycle ou demy rond, et la faire en tiers poinet ainsi que vous voiez les formes des vitres aux Eglises modernes. Comme quoy, au lieu que l’hemicycle se prend d’un centre, ces façons icy se prennent de deux: ainsi que pouuez coignoistre par la figure ensuiuante, en laquelle le lieu marqué C, de toute sa largeur se diuise en trois parties egales, desquelles faut prendre les deux, et mettre la pointete du compas sur vn des centres, et l’autre sur l’extremité de la largeur, et en faire la circonference. Apres vous remuerez ledict compas et le mettrez en l’autre centre, et en ferez autant pour l’autre costé, et voirrez la montee qui sera beaucoup plus haute que le demy rond. Mais il faudroit auoir deux centres (ainsi que nous auons dict) pour changer la pointete dudict compas à faire telle circonference des deux costez:.....Si voulez les couuertures plus hautes et que le comble soit

Bon conseil et digne de noter à bons espritz et ingenieux.

plus droict, il ne faut que diuiser la largeur de l’œuvre en quatre parts, et en prendre les trois pour tirer la montee. . . . Ou si vous voulez encores faire vostre œuvre d’aussi grande hauteur comme ont de costume aucuns charpentiers, ainsi le pouuez faire. Faut prendre avec le compas la largeur de tout le bastiment et vous voirrez la forme d’une haute couuerture, qui est aussi large que haute par ses courbes: et seroit un triangle equilateral, qui le voudroit tirer à ligne droicte par les costez.”—(p. 33.)

¶ Yet Delorme, in his “Architecture,” p. 110, appears to use, in the following passage, the term *tiers poinet* in its general sense for all pointed arches:—“ . . . on fait . . . lesdictes branches d’ogives plus haute que l’hemicycle et d’une circonference que les ouvriers appellent à tiers poinet, et de hauteur plus ou moins, à la volonté de l’ouvrier: elles se tirent de deux centres, au lieu que l’hemicycle ne se tire que d’un.”

(p. 156), has decided that the term *tiers-point* belongs to the equilateral arch. A few pages farther on, however, (at p. 165,) having in the meantime met with a passage^a in Dubreuil's *Cours de perspective*, 1642, which defines this arch in the same manner as Delorme, he declares himself convinced that his former application of the term must be abandoned.

The exact meaning of the terms in question was soon forgotten after the disuse of Gothic architecture. In Italy, Viola (in 1629, p. 234) defines the *terzo acuto* to be the equilateral arch, because it contains an equilateral triangle, and his *quarto acuto* and *quinto acuto* are pointed arches, which are respectively described about a square and a pentagon. In the former the lower side of the square coincides with the span-line, the lower angles of it are the centre points of the arch, whose radius is the diagonal. Thus, his *quarto acuto* becomes very nearly our *fourth point*, but is rather higher in proportion to its span. In his *quinto acuto* the lower side of the pentagon coincides with the span-line, and the centre points are, as in the former cases, at the extremities of the side, and the radius is the line which joins the centre point to one of the two opposite angles. This arch is also very nearly the *fourth point*, but is rather lower than it.

I have had frequent occasion to observe, in measuring English examples of arches, that the centre points are, in many cases, really so placed as to correspond with a division of the diameter into equal parts. At Cambridge, for example, the pier-arches of the nave of Jesus College Chapel and of Cherry Hinton Church are exact arches of the third point, and the tower-arches of the above chapel are of the fourth point. The pier-arches of St. Michael's Church are of the sixth point, and the narrow arch into the tower is equilateral. I have also met with divisions that do not admit of the application of this nomenclature, such as the division of the span into seven or eight parts, of which five are taken for the radius. The ancient roof of Gonville Hall has an arch that belongs to the latter, and the northern arches of the choir of Jesus Chapel to the former, proportion. Arches are also met with which, being more acute than the equilateral, have their centres on the outside of the arch. For example, the centres of the soffits of the pier-arches in St. Edward's Church, Cambridge, are at a distance of exactly half the span

^a The passage (p. 61, Second Edition, 1679,) relates merely to the arch *en tiers-point*, and is not, like that of Delorme, explanatory of the other kinds of arches, to which it does not even allude. After having shewn the mode of tracing the *arc en tiers-point* in the form which is more properly called the equilateral arch, Dubreuil adds, "Le vray tiers point est la figure. . . . On divise le diametre en trois par-

ties égales," &c.; proceeding so as to describe the arch of the third point as explained in the text. He concludes by saying that this arch is *en tiers-point* as well as the other, and that the one or the other may be employed, but that the ancient churches approach more to the first kind than to the second, and that they have arches even more acute than the first.

beyond the springing points, so that the span is two-thirds of the radius. These methods of defining the proportions of pointed arches are manifestly convenient for giving instructions to workmen or writing descriptions.

In all the cases quoted above, the arch measured is that of the soffit. But it must be observed that mediæval arches are made up of a number of concentric arches, and that every one of these is necessarily of a different proportion to the soffit. Sometimes the simple form of arch that belongs to the third or fourth point will be found in one of the superior orders, or even in the hoodmold. But that the nomenclature was employed in the middle ages in the manner above described is perfectly certain; and the manuscript of Wilars de Honecort shews that its origin dates from a very early period, probably soon after the introduction of pointed forms. In his own drawings of buildings, as at Rheims and Laon, he uses the equilateral arch.

The explanation of the diagrams No. 23 and 24, which shew how to cut the key-stones of an arch of the third point and

of other points, appears to be as follows: let $E A F$ be a pointed arch, of which the voussoirs of one side are shewn on an exaggerated scale for the sake of distinctness; and let B and D be the centres from which the halves of the arch are struck respectively. The ordinary voussoirs, as $K L$, have their joints directed to the centre B . But the key-

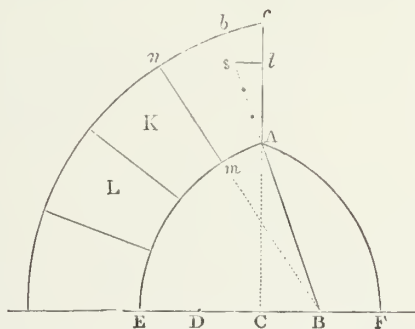


Figure 13—Arch of the Fourth Point.

stone has only its lower joint, nm , directed to that centre; its upper joint, cA , is vertical and directed to the middle point, C , of the span. The dotted line bA , directed to the centre B , shews that the difference between a common voussoir, $nm bA$, and the key-stone, consists in the additional triangular-piece $A b c$. If, therefore, the head of a common voussoir be first delineated, and the additional triangle added, the form of the key-stone will be obtained. This triangle can be constructed as follows. If from any point s on $A b$, we draw st perpendicular to $A c$, the triangle $A s t$ will be similar to the triangle $A B C$, for the angle at the apex A is the same in both. Now AB , the radius of the arch, is equal to BE , which is the distance of the centre point measured on the span-line, and BC is one of the parts into which the span-line is divided in order to obtain the places of the centres. The proportion of AB to BC varies according to the position of the centre points, but is always known when the name of the arch is known; and the ratio of As to st being the same as that of AB to BC , the small triangle can be laid down when the name of the arch is given, without reference

to its actual dimensions. The figure represents an arch of the fourth point, in which the span is divided into four parts, and three of them taken for the radius. To describe the key-stone, first draw the head of a common voussoir, $m n A b$, then set off with any convenient distance three equal parts from A to s , and from s as a centre, with the same distance strike a small arc of a circle by which a line $A t c$ may be drawn, which will complete the keystone $A m n c$.

For the other denominations of arches the proportions of the triangle $A s t$ are as easily obtained, but require some explanation. In the equilateral arch $A B$ or $B E$ is equal to twice $B C$, therefore $s t$ is one-half of $A s$. In accordance with the nomenclature of the other arches, the equilateral arch might be named of the *second point*.

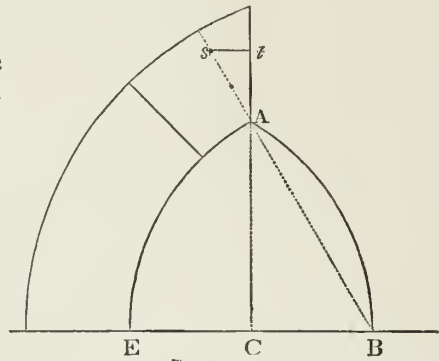


Figure 14.—Equilateral arch.

In the arch of the third point, which is the first of Wilars de Honecort's examples, the distance $B C$ is half of one of the three spaces into which the span-line is divided, and $C B$ is consequently a quarter of $A B$, and $s t$ a quarter of $A s$.

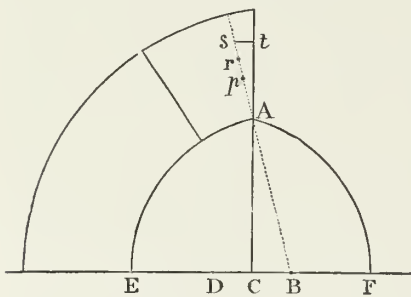


Figure 15.—Arch of the Third Point.

In Honecort's figure he has indicated this proportion by bisecting $A s$ in p , and again bisecting $p s$ in r , thus producing only three points of division ;

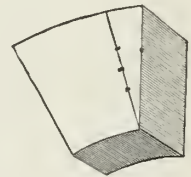


Figure 16.

but, either by error or intentional mystification, has placed these points at apparently equal distances as he has equally done in the circular diagram above, already explained. His figure appears intended for a perspective view of the key-

stone when finished, as in fig. 16.

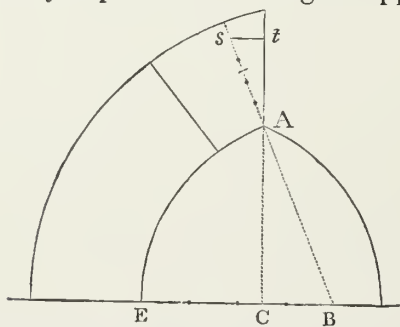


Figure 17.—Arch of the Fifth Point.

In the arch of the fifth point, the second example of Honecort, the distance $B C$ is one and a-half of the divisions of the span, therefore $A s$ being divided into four equal parts, the second part must be bisected to obtain the

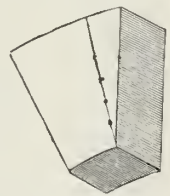


Figure 18.

length of $s t$. Thus the five strokes on the diagram given by Honecort may

be accounted for, or, which is more likely, the line *As* in his diagram is divided into four equal parts by the marks, and the bisection meant to be left to the eye, when the compasses are opened to the distance of one and a-half^r.—(W.)

25.

“Par elu tailon one clef del quint point.”

“Par ce moyen taille-t-on une clef de quint-point.”

This is a little spiral traced with the compasses in the simple and well-known manner of describing a series of increasing semicircles on the upper and under sides of a line alternately. No connection is discoverable between the spiral and the key-stone of the *quint-point*, and it seems merely to be an example to shew how spirals may be drawn^s.—(W.)

26.

“Par elu fait on on piler de quatre cuins venir a loison.”

“Par ce moyen dispose-t-on liaisons d’un pilier quadrangulaire.”

“Thus may be arranged the bond of a square pier.”

The four *cuins* may be either translated to mean the quoins or corners of the pier, or the four stones of which each course consists. The mode of giving bond is by disposing the joints in a slanting direction across the pier, as the plan clearly shews. The next course is manifestly intended to have its joints similarly arranged, but in the reverse direction. Thus the joints of the one course are situated over the solid parts of the other course, (or, as English workmen term it, the courses break joint.)—(L.)

Otherwise, the drawing may be supposed to indicate that each course consists only of two oblong stones, which are laid so that the joint of one course shall lie across the joint of the next.—(W.)

^r With respect to these two diagrams of the key-stones of the *tiers-point* and *quint-point*, Quicherat merely suggests that they represent each key-stone developed with respect to three of its faces; and Lassus supposes it to be seen with respect to two of its faces, its head and its joint, with which my explanation concurs. As to the marks of division, Quicherat leaves them unnoticed, and Lassus thinks that they are intended to shew that the two lines close together (*As* and *Az*) are meant for one only.

^s M. Quicherat supposes the figure to be an ex-

ample of the junction of arcs of circles of different radii, which may have been used in the description of four-centered arches, and Lassus suggests that it was a method of dividing the span of a given arch into five equal parts, in order to find the centres of the arch of the fifth point. For this purpose, however, it is useless, for it would require the span to be first divided into ten parts by some other method to find the two centre points of the semicircles. (Vide No. 40, below.)—(W.)

27.

“Par chu tail on vosors par esscandelon.”

“Par ce moyen monte-t-on des voussoirs par échelons.”

“How to cut voussoirs by a scale.”

Two lines are drawn at right angles to one of the joints of the voussoir to meet the opposite joint. The upper line is therefore necessarily longer than the lower line, yet each of them is divided into eight equal parts. It follows, therefore, that if any other line be drawn from one of the divisions of the lower scale to the corresponding division of the upper scale, this line will converge to the same point as the joints of the voussoir. If the head of a given voussoir happen to be too broad to fill up the space intended for it, which may sometimes be the case, this geometrical construction will enable a new joint to be correctly drawn at the proper width. According to this view, the object of the rule may be stated to be, “How to reduce the width of a ready-made voussoir †.”—(W.)

~~~~~  
28, 29.

“Par ceste raison <sup>u</sup> montom laguile done toor. et taille les moles.”

“Par ce moyen monte-t-on l’aiguille d’une tour et en taille-t-on les modèles.”

“By this rule (or proportion) we set up the spire of a tower and cut the molds, (or patterns of the stones).”

The drawing (No. 28) is a diagram of a spire upon which a central line is drawn, divided into four parts, each of which is equal to the base of the spire. This indicates that the height of the spire is four times its breadth at the base, which must therefore be the rule in question. In fact, Wilars must be considered as recommending this proportion as the best for a spire, and it is exactly that of the Cathedral of Bayeux, amongst others.

This example (like No. 9) shews that the masons of this period did not

† The two lines may meet the joints at any convenient angle provided they be parallel. Quicherat conceisely states this to be a method of “cutting voussoirs by scales, that is to say, by means of a scale of proportion established between the extrados and the soffit.” This is not the case, because the scale-lines are drawn at right angles to one joint, at arbitrary points, and therefore are not in the same ratio as that of the soffit to the extrados. Lassus, on the other hand, conceives that the scales are used to enable the extrados of a voussoir to be described when the soffit and joint lines only are given. A ruler being cut equal to the height of the

voussoir, and laid in turn upon each pair of corresponding points of the respective scales, keeping one end of it in contact with the soffit, a series of points may be set off at the other end through which the extrados may be described.—(W.)

<sup>u</sup> Neither Quicherat nor Lassus have remarked upon the use of the new expression, “Par ceste raison,” instead of the usual “Par chu:” they have translated the legend in the manner of the others,—“Par ce moyen, &c.,” and interpreted the process as merely shewing how to make a mold or pattern of the same inclination as that of any given spire.

employ the jointed bevel, and that their angles were measured and designated not by *degrees*, the divisions of a circle, but by *gradients*, the proportion of height to length, which defines the inclination of a sloping line to a horizontal one. We should now express this as the proportion of the tangent to the radius.

For the molds (No. 29) a right-angled triangle is constructed, of which one side is divided into eight parts, and one of these parts set up for the other side, and thus the inclination of the third side, or hypotenuse, becomes the same as that of the side of the spire to its base.—(W.)

The figures in the lower part of the plate are somewhat entangled together, and require a little explanation. An arcade of semicircular arches resting on five single pillars is represented in an unfinished state. Two of the arches only are turned, and the last pillar on the right hand has not yet received its capital. This arcade serves to illustrate two processes, which are designated below as Nos. 30 and 31. No. 32 represents a tower, and beneath No. 30 is a figure of a man in a kneeling position, occupied in observing the height of the tower by means of an instrument. We may now examine the nature of these three different subjects.

## 30.

“Par chu tail om vosure pendant.”

“Par ce moyen taille-t-on les voussures pendantes.”

“How to cut the *voussoirs* of hanging arches.”

In an arcade of the kind represented in the figure it sometimes occurs that one wider opening than the rest may be required, and that this is obtained by dispensing with the pillar at that place, and so constructing the two arches which would have rested on it that they appear as if suspended in the air; generally a hanging boss is added in the place where the capital of the pillar would have been, and such a one is represented in the drawing, for the rough pillar is merely a scaffold-pole temporarily placed under the boss to assist in setting the arch-stones, but intended to be removed when that operation has been completed.

The artifice which enables these two arches to stand without the pillar consists in cutting their *voussoirs* in such a form that their joints all tend to a single point beneath the boss: thus the two arches form really only one large one, which rests upon the two lateral pillars, but has its soffit cut into the form of two arches,—a curious example of discrepancy between the mechanical and decorative construction. It is extremely well explained in the diagram by the string tied to a nail which is driven into the place of the centre of the real arch in the tem-

porary prop. Lassus, whose explanation is substantially the same as the above, is unable to cite an example of this artifice of construction so early as the thirteenth century, but states it to be more common in the succeeding ones, especially in the fifteenth, in which the *jubé* of St. Madeleine at Troyes offers a magnificent specimen<sup>x</sup>.—(W.)

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 31.

“Par chu montom dous pilers done hautece sens plom. et sens nivel.”

“Ainsi l'on monte deux piliers de même hauteur sans fil-à-plomb et sans niveau.”

“Thus two pillars may be set up at the same height without the help of plummet or level.”

A most rude and primitive contrivance, which simply consists in driving a stake into the ground midway between the two pillars. The stake is provided with a rod which swings on a pin in the stake, so that it can be brought to rest against each of the pillars in turn. If it be cut to such a length as to reach to the top of the shaft already fixed, it will, when brought into contact with the second shaft, touch it at a point at the same level as the top of the former. It is hardly necessary to add that the least deviation from the exact middle point in the position of the pin upon which the rod swings would entirely vitiate the process<sup>y</sup>.—(W.)

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 32.

“Par chu prentom le hautece done toor.”

“Par ce moyen prend-on la hauteur d'une tour.”

“How to take the height of a tower.”

A board cut in the form of a right-angled triangle of which the two sides are equal is set up upon two equal legs in the direction of the tower: the observer shifts this rude instrument along the level ground until he has succeeded in placing it at such a point that by taking a sight along its slant side, or hypotenuse, he hits the top of the tower; he then measures the horizontal distance from the lower extremity of the hypotenuse to the tower, which will be equal to its height. The line drawn in prolongation of the base of the instrument to the tower is apparently intended to point out that the height so obtained must be measured from the point at which a sight taken along the base strikes the tower. This, taken in conjunction with the methods of measuring the breadth of a river and the width of a distant opening, already given<sup>z</sup>, forms a very curious illustration of the extreme poverty of the art of measuring heights and distances in the thirteenth century.—(W.)

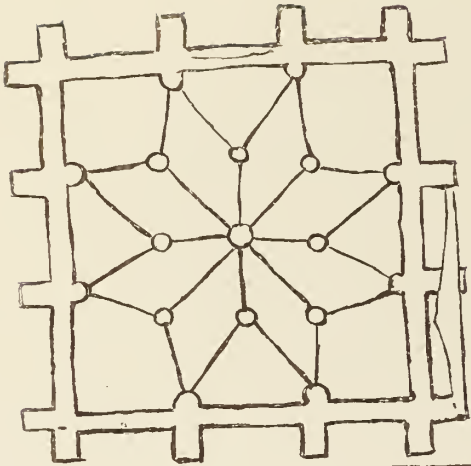
<sup>x</sup> Quicherat imagines this diagram to relate to the ordinary vaulting surfaces of mediæval rib-vaults, but is in this instance undoubtedly mistaken.—(W.)

<sup>y</sup> The above interpretation is the same as that given by both Quicherat and Lassus.

<sup>z</sup> See p. 128, above.

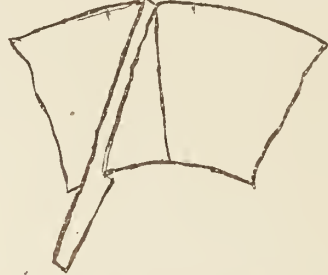


En chascun  
s. 15.



Pa chu met om on capitel dunt colou  
bes a ote sole. seu nest myes h en con  
bref. set h machonerie bone

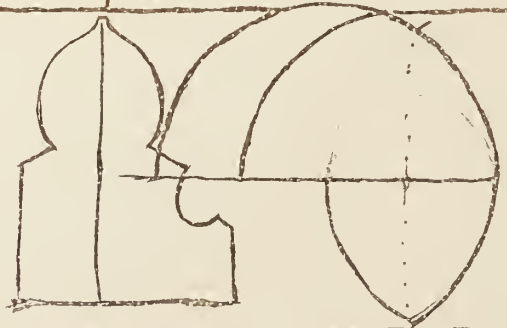
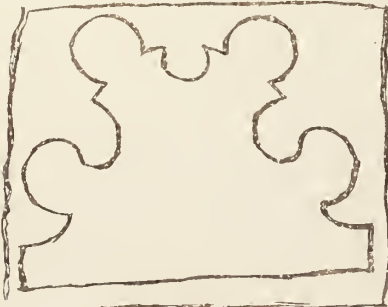
ohu Par met om on oef des sos one  
poire par mesure. que li poire  
chice soz hief



par chu portrayt om one  
toor a chue arestes

par chu tro  
uom let poraf  
done uofure tallie.

par chu do nom on  
uofor se rumeje. sens  
molle



par chu beainn errasement  
tagist sens molle. par on  
membre

pa chu tail om uofu  
re engenolje

par obu fait om  
trois manres  
dars. a coupaf  
ouvir one foif

## PLATE XL.

RECTO OF THE TWENTY-FIRST LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE NUMERAL VII.

Followed by a blotted writing which the French editors read, "commencent à v," but which, at any rate, appears intended to explain the change of system in the paging from alphabetic letters to Roman numerals, and the accidental omission of one letter, mentioned above at page 119<sup>a</sup>.—(W.)

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33.

"Pa chu met om on capitel duit colonbes a one sole. sen nest mies si en combres. sest li machonerie bone."

"Par ce moyen combine-t-on les chapiteaux de huit colonnes correspondant à une seule, sans qu'il y ait encombrement: c'est de la bonne maçonnerie."

"Thus the capitals of eight shafts are connected with one central one. This is good masonry."

The plan represents an isolated square chamber having two vaulting shafts against each wall, and a buttress corresponding to each on the outside. In the centre of the chamber is a shaft in the manner of a chapter-house. The eight lesser circles in the intermediate space represent the bosses of the vault, and the lines connecting these with the shafts are the vault-ribs.

The only part of the plan which is not quite intelligible is the mode of vaulting the compartment at each angle, which is in the form of an irregular quadrilateral. Lassus observes, that as the two sides of this compartment which belong to the external wall must have had wall-ribs in the form of an arch, and as the lines which form the other sides of the compartment are semi-arches springing from the wall to meet in the boss, it follows that another rib is wanting, which, springing from the corner of the apartment and rising to the same boss, should divide this compartment diagonally. In his accompanying plan these ribs are supplied in the left-hand half of it, and in the right-hand half two other ribs, D B, B D, are added, to shew the construction of the vault of a chapel in the Church of Moulherne, near Saumur. I think it probable, however, that Honecort intended to

<sup>a</sup>

|    |       |
|----|-------|
| 33 | 34    |
| 35 | 36 37 |
| 38 | 39 40 |

This table shews the order of the numbers of reference employed in the explanations of the diagrams in this plate.

vault the compartment in question with three vaulting surfaces, one of which would rest upon the two neighbouring wall-ribs that spring together from the

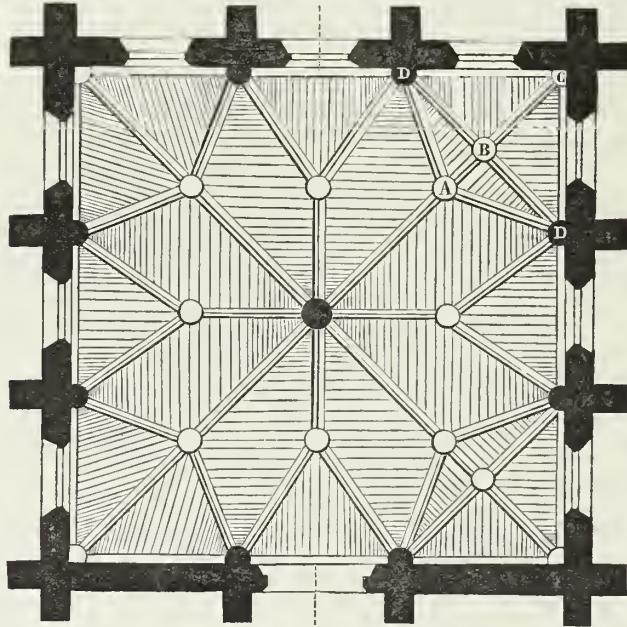


Figure 19.

corner of the chamber, and each of the two others extend from one of the vault-ribs, D A, to its neighbouring wall-rib.—(W.)

~~~~~  
34.

“Par chu met om on oef des sos one poire par mesure. que li poire chice sor luef.”

“Par ce moyen met-on un œuf dessous une poire en prenant les mesures de telle sorte que la poire tombe sur l'œuf.”

“Thus may an egg be placed under a pear, by taking proper measures, so that the pear shall fall upon the egg.”

This operation is performed by means of a pair of mason's plumb-rules. One of these is set up vertically near the tree, and the other, on the opposite side of the tree, is adjusted until a sight taken along the edge of one to the edge of the other will also pass through the pear. A line drawn joining the feet of the two plumb-rules will consequently pass vertically under the pear. The same operation repeated in another direction will give a second line passing under the pear, and the egg must be placed at the intersection of the two. One of the plumb-rules is, in the drawing, entangled in the plan of the chapter-house.

35.

“ Par chu portrait om one toor a chinc arestes.”

“ Par ce moyen trace-t-on une tour à cinq arêtes.”

“ How to trace the plan of a five-cornered tower.”

This seems to be a simple approximate mode of laying down a pentagon, which is, however, not described in any work that I have seen, but from the figure must depend upon the following principle.

Let the side AB of a regular pentagon, $ABCDE$, be produced to f , and a perpendicular, fg , be drawn; fBg , being the external angle of the pentagon, will contain 72 degrees. Now the tangent of 72° is so nearly equal to three times the radius that it may be assumed to be exactly so without sensible error^b. As fg is the tangent of the angle fBg to radius Bf , we have a simple rule for setting out the pentagon. If AB be the given position of the first side, set off any convenient distance Bf in prolongation of it, and draw fg perpendicular to Bf , and three times its length. Join Bg and produce it, setting off BC equal to AB , and BC will be the second side of the pentagon. Repeat the operation at the angles C and D , by which the sides CD and DE are obtained. It only remains to join EA , and the pentagon is completed^c.—(W.)

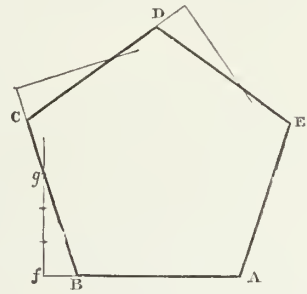


Figure 20.

36.

“ Par chü trovom les pois done vosure taillie.”

“ Ainsi trouve-t-on le point (de centre) d'une voussure taillée.”

“ How to find the centre point of a finished voussoir.”

This simply consists in stretching two strings from the upper corners of the head, keeping them in exact coincidence with the joints. The point of their intersection will be the centre required.

^b The tangent of 72 degrees is to the radius as 3.078 to unity, and if fB be set out one foot in length, and fg three feet and one inch, the angle will be sufficiently accurate. But if the inch be omitted, the work will be as correct as mediæval work is in general. In fact, it is the tangent of $71^\circ 34'$, that is exactly three times its radius, therefore the error in each angle of the pentagon set out by the above process is 26 minutes.

^c This diagram has passed unnoticed by Quicherat, and Lassus has explained it to be the plan of a tower with angular projections or corbels for the erection of overhanging construction at the upper part, intended for defence.



Figure 21.

37.

“Par chu donom on vosoir se tumeie^d. sens molle.”

“Ainsi donne-t-on au voussoir sa coupe sans moule.”

“*Thus is given to a voussoir its swelling (or convexity) without a mold.*”

It appears that in this case the soffit of the voussoir is supposed to be already finished, and that from it a gage cut to the proper length is employed to trace the convex line of the extrados by sliding the gage along the soffit and keeping it always in the radial direction.—(L.)

38.

“Par chu bevum erracement jagiis sens molle. par on membre.”

“Par ce moyen l'on biaise les arrachements jaugés pour chaque membre sans moule.”

The obscurity of this inscription is so great that its meaning can only be conjectured after examining the probable object of the process. The word *erracement*, already employed in No. 6, is undoubtedly the same as *arrachement*, the *tas de charge* of Delorme, which means the lower part or spandrel of a ribbed vault. This part is built solidly into the wall, consisting of level courses of masonry, and includes the beginnings of the ribs as they spring from the abacus of the vaulting-shaft, and have their moldings entangled and partly concealed by their approximation. I have elsewhere^e explained at length the method by which these moldings were worked out of the solid, and have shewn, from examination of the beds of ancient spandrels from the thirteenth century downwards, that the form of each bed was carefully traced upon the stone by applying the pattern of each rib in succession in its proper position to the surface, and tracing its outline. The drawing in the manuscript compared with that which I have there given of one of the stones of St. Saviour's Church, will shew that the former represents a stone upon which the outline of the whole has been traced, and doubtless in the manner developed in the latter. But in Wilars de Honcourt's drawing there are no lines or marks to indicate the process: the stone is apparently one of the lowest of

^d TUMERIE. Enflure, bouffisure, vague, tumor.—Roquefort, *Glossaire de la Langue Romaine*. Neither Quicherat nor Lassus have noticed the contraction mark in the word “tumeie;” and they have translated the legend, “Ainsi on donne à un voussoir sa coupe sans moule.” The inclined position of the gage seems to require some other explanation of the pro-

cess than the above, but I confess my inability to suggest one. The drawing looks like two voussoirs in contact.—(W.)

^e Construction of the Vaults of the Middle Ages, *Transactions of British Architects*, vol. ii., and Daly, *Révue d'Architecture*, t. 4.

the set, in which the ribs are so closely approximated as to shew little more than their front bowtells. In fact, no transverse rib appears. A wall-rib is shewn on each side, and the nascent forms of two diagonal ribs. Either, therefore, this specimen belongs to the vault of a radiating aisle, or some such vault in which only two ribs spring from the wall, or the transverse rib rises so much more vertically than the diagonals as to be entirely concealed by them at this low level.

M. Quicherat also understands the drawing to mean one of the springing stones of a vault, containing the entangled ribs, but, without attempting to explain the exact nature of the process, confines himself to the interpretation of the legend. The verb *bever* employed in it must be, he says, analogous to the word *beveau*, *buveau*, or *biveau*; (Anglicè, a *bevel* for taking the angles of oblique surfaces). *Bevum* is, therefore, *on biaise*, 'we bevel.' *Jagis* must be a form of 'gaged,' and by *membres*, or 'members,' are to be understood the different branches of the spandrel which correspond to the respective ribs. Thus the sense of the legend becomes, "Par ce moyen on bive (ou biaise) arrachements de voûte jaugés membre par membre sans le secours d'un modèle en relief." But this commentator is under the impression that the operation which the legend refers to consists in the mode of working the joints of these separate ribs at the proper angle, not being aware that the joints in the spandrel beds are horizontal. Neither does this interpretation bear any relation to the molded profile. I should rather conjecture the word *bevum* to refer to the process of working the moldings, and the *gaging* of them to mean the marking of the respective points at which the molds of the separate ribs are laid on the bed, which points must be transferred from the full-sized drawing of each rib-line by *gages* on the same principle as the operation in No. 6, (p. 124). The legend under this supposition will bear the following sense,—“Thus we work the moldings of vault spandrels by gaging each rib separately, without cutting a mold for the whole.” But the obsolete language, combined with the slight indications of the drawing, throw such a veil of obscurity over the whole, that this interpretation can only be offered as a bare conjecture^f. Indeed, it must be confessed that the drawing looks very much like the mold of a rich single rib, and may be intended for one only of the rib-molds employed in the operation alluded to.—(W.)

^f Lassus adopts the interpretation given by Quicherat, but points out the mistake concerning the horizontal joints, and directs attention to the error they occasion by the oblique section of the moldings

which result. This point I have already fully discussed in the paper on vaults above referred to.—(W.)

39.

“ Par chu tail om vosure engenolie.”

“ Par ce moyen taille-t-on un voussoir engenouillé.”

“ *This is the mold of a cusped voussoir.*”

In the description given by William of Worcester, in the fifteenth century, of the moldings of the west door of Redcliff Church at Bristol, he tells us that “ the west dore ys fretted in the hede wyth grete *genlese* and small.” This expression I ventured to apply to the cusps with which the door-arch, still in existence, is ornamented, or “ fretted.” I did this on the ground that a large cusp might be described as a *knee-piece* from its form, and that *genlese* was probably a corruption of *genouils*^g.

The unsymmetrical profile in the figure is exactly that of a portion of an arch in tracery with cusps, the great central molding being that of the arch, and the lateral appendage belonging to the cusp. Thus *voussoir engenouillé* may be rendered a ‘cusped voussoir^h.’—(W.)

40.

“ Par chu fait om trois manires dars. a compàs ovrir one fois.”

“ Par ce moyen l'on fait trois manières d'arcs avec une seule ouverture de compas.”

“ *Thus can be drawn three kinds of arches with one opening of the compasses.*”

After the explanations given under No. 24 of the different forms of arches, it

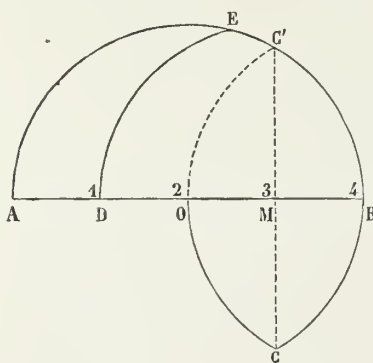


Figure 22.

is only necessary to state that in this diagram a line A B is drawn and divided into four equal parts in D, O, M, B. The opening of the compasses to be employed is the half of this line. Setting therefore the point of the instrument in the centre, O, a semi-circular arch, A E B, is first described. The point is next shifted to M, and the arc D E drawn, meeting the semicircle in E. Thus we obtain the second arch, D E, B E, which is manifestly of the *third point*, as the centres from which it was struck are at the points O, M, which divide the span D B into three. Lastly, the centre being assumed at B, the arc O C is drawn, and this, combined with B C, pro-

^g Vide *Architectural Nomenclature of the Middle Ages*, p. 55, (No. IX. of the publications of the Cambridge Antiquarian Society, 1845).

^h Lassus views this drawing as representing two

different semi-profiles of a vault-rib, separated by a line, and refers the term *engenouillé* to the sharp edge of the bowtell. The profile, he says, is the same as that of the vault-ribs of the Saint Chapelle.

duces the third arch, which is clearly the *equilateral*. For some reason, perhaps to disentangle more clearly the forms of the arches, Wilars has drawn the *equilateral arch* in an inverted position. The dotted line OC' and the vertical line $C'C$ exist in the manuscript, but the vertical is carefully divided by a series of points pricked in the parchment into fourteen equal parts, that is to say, seven from C' to M , and seven from M to C . A semicircle, more faintly shown in the engraved facsimile than in the original, is described from the centre M , with radius MB , and it cuts the line $C'M$ in the fourth point, and thus indicates that the height of a semicircular arch is to the height of an equilateral arch of the same span in the ratio of four to seven, and also that the height of a pointed arch is to its base as seven to eight. This is one of the rough approximations of practical architects, the real ratio being seven to eight and one-twelfth very nearly¹.—(W.)

¹ The French editors have described the diagram after the same general manner as the above, but have taken no notice of the dotted arches and division of the altitudes. M. Lassus was at first disposed to

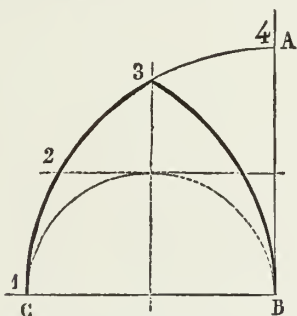


Figure 23.

confine the name of *tiers-point* to the equilateral arch, on the ground of the following simple geometrical properties which he found in the *Geometrie pratique* of Charles Bouvelle, 1542:—If a quadrant of a circle CA be described from a centre B , and divided into three equal parts by the four points 1, 2, 3, 4, the third, or *tiers-point*, will be the apex of the equilateral arch $C3, B3$, described upon CB . For as two-thirds of a quadrant is equal to one-sixth of the entire circumference, the chord of $C3$ is equal to one side of the inscribed hexagon, and therefore equal to the radius CB . Hence $C3B$ is an equilateral triangle. Another property of this figure is, that if from the second point, 2, a line be drawn parallel to the radius, it will be a tangent to a semicircle described upon CB as a diameter. (Vide note of M. Lassus in the *Bulletin. Com. Hist.*, t. i.

pt. ii. p. 81, and p. 156 of the French edition of Wilars de Honecourt.)

In commenting, however, upon the diagram in the text above, he confesses that the name *tiers-point* must be transferred to the arch DEB , because the span-line of that arch being divided into three equal parts by the points marked 1, 2, 3, 4, the centre will be found upon the third of these points, and thus he derives the name of *tiers-point*, given to the arch formed of two arcs of a circle symmetrically described from the points O and M .

He similarly explains the name *quint-point*, or arch of the fifth point, (No. 24, p. 138, above,) to have arisen from the fact that the span-line being divided

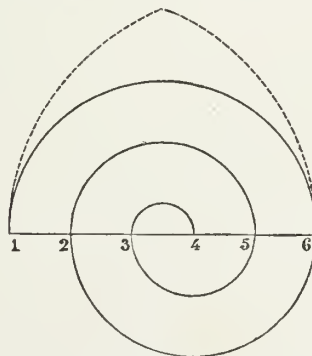
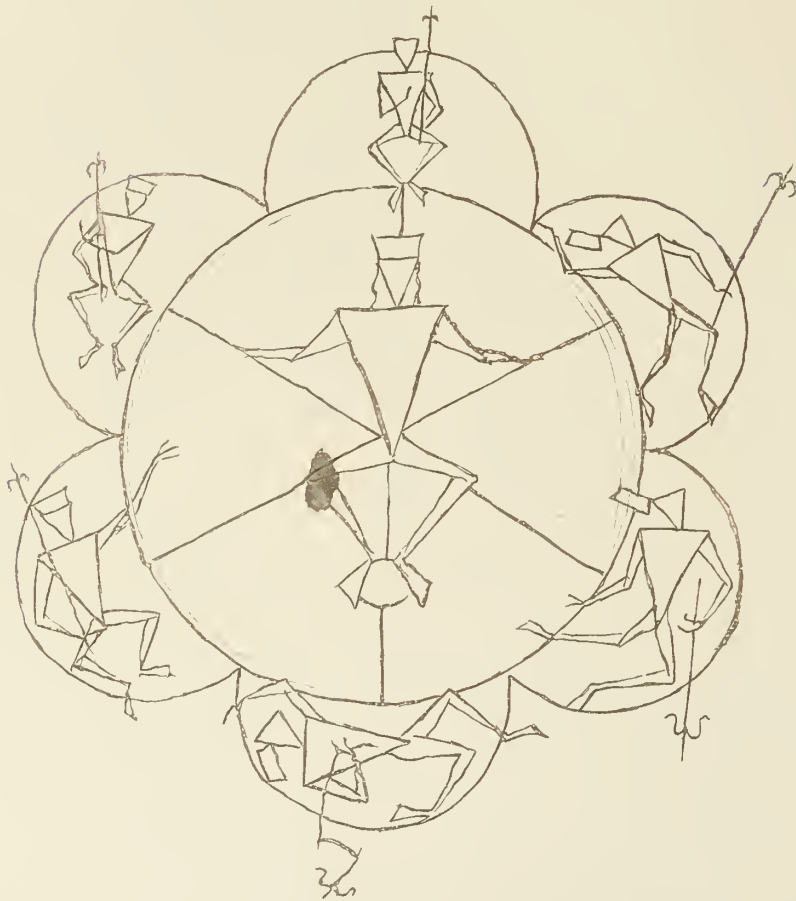


Figure 24.

into five equal parts by points 1, 2, 3, 4, 5, 6, the fifth points thus reckoned from each extremity are respectively employed as centres for the two sides of the arch. As already mentioned, he is of opinion that the spiral was used to perform the division (p. 143, above).—(W.)

Les 12. restes de fuelles.

Les 12. restes de la rivee de
fortune. total les .viij. i magenes



On prent kaus z tveile nulue de paiens z ferrekuime. autie tant
del une cu del autre z un poi plus del tveile de paiens tant come
sel color uantke les autres. destempiez ce amerc doile de linuise.
sen porz faire un uassel pur euge tenir.

On prent unue kaus tolete z oxpieument se lemet on en euge bol
laus z oile. Cist unemens est bon por pail olier.

PLATE XLI.

VERSO OF THE TWENTY-FIRST LEAF.

“Ves la .ii. testes de fuelles.”

“Voici deux têtes de feuilles.”

“Behold two foliated heads.”

THIS legend relates to two heads on the following plate, the opposite page of the manuscript.

~~~~~

“Vesci desos les figures de le rucee de fortune. totes les .vii. imagene.”

“Voici dessous les figures de la roue de Fortune, toutes les sept ayant leur image.”

“Beneath are the figures of the Wheel of Fortune, each of the seven having their proper image.”

This is the drawing of a rose with six foils, or lobes, apparently intended as a design for a painted window. In the centre, Fortune is seated, her feet resting on a globe, holding a spoke of a wheel in each hand, and thus turning it. A king is in each lobe; those to the left are rising towards sovereign power, those on the right are descending, or rather falling, from it. This double action, displayed by the energetic and appropriate attitudes of the several figures, sketched by triangles, according to Wilars de Honecort's “method of portraiture,” is explained in a manuscript of Brunetto Latini, which is in the Bibliothèque de la rue Richelieu. There, as here, Fortune is placed in the centre and turns the wheel, but is standing; the human figures cling to the circumference of the wheel, on the one side climbing, and on the other tumbling and holding on as they may. But there are eight of them, instead of six, and each has an appropriate legend. The one placed at the bottom, under Fortune's feet, cries out, *Sum sine regno*, I have no kingdom. With those who are rising on the left, hope develops itself in order under these different phrases,—*Spes*, Hope; *Regnabo*, I shall yet reign; *Gaudium*, Joy. He who is seated full of assurance at the top of the versatile engine, cries out with pride, *Regno*, I do reign. But those who are descending to the right, exclaim, *Timor*, Fear; *Regnavi*, My reign is ended; *Dolor*, Sorrow.

A wheel of this kind sometimes represents the different ages of life, as, for example, in a painted window at Canterbury Cathedral, which has six periods as

here. At Troyes, in a window of the sixteenth century, there are seven ages. But the artists used also to sculpture such wheels round their rose windows, as at the north front of St. Etienne of Beauvais, and that of Bâle, about the twelfth century, and at Amiens in the fifteenth century<sup>k</sup>. They even employed moving Wheels of Fortune, to remind men of the little confidence that must be placed in her precarious gifts. Baldricus, Bishop of Dole, mentions one of these which he found in continual rotation in the Abbey Church of Féchamp at the end of the eleventh century, and took as the text of an exhortation to young monks who take the cowl without mature reflection<sup>l</sup>.

Beneath the Wheel of Fortune, Wilars, changing his subject with the versatility of the machine, has written receipts for an hydraulic cement and a depilatory paste.

“On prent kaus et tyeule mulue de paiens. et feres kume. autre tant del une cum del autre. et un poi plus del tyeule de paiens. taunt come ses color vainke les autres. Destempres ce ciment doile de linuse : sen poez faire un vassel pur euge tenir.”

“On prend chaux et tuile de païens pilée, et vous ferez autant de l'une que de l'autre, mettant un peu plus de tuile de païens, jusqu'à ce que sa couleur domine l'autre. Détrempez ce ciment d'huile de lin, et vous en pourrez faire un vaisseau à contenir l'eau.”

“Take lime and pounded pagan (Roman) tiles in equal quantities, adding a little more of the latter until its colour predominates. Moisten this cement with linseed oil, and with it you can make a vessel that will hold water.”

This ceramic paste, prepared cold, must have had a great analogy with the “*mastic de Dilh*,” which is also prepared with linseed oil, and acquires such hardness that it may be substituted for stone in the repair of outside sculptured work.

It may be supposed that the paste was meant not merely for portable cups, but as an hydraulic cement to line cisterns for keeping rain water.

“On prent vive kaus bolete et orpieument se le met on en euge bollans et oile. Cist unnemens est bon por pail ostier.”

“On prend de la chaux vive qui a bouilli et de l'orpiment, et on les met dans de l'eau bouillante avec de l'huile. C'est un onguent bon pour ôter le poil.”

“Take slacked lime and orpiment (yellow sulphuret of arsenic), and mix them in boiling water with oil. This is a good unguent to remove hairs.”

This depilatory paste is nearly the same as that still employed in the East.—(L.)

<sup>k</sup> Didron, *La vie humaine ; Annales Archéologiques*, t. i. p. 241, &c.

<sup>l</sup> *Neustria pia*, p. 231.





## PLATE XLII.

RECTO OF THE TWENTY-SECOND LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE NUMERAL VIII<sup>m</sup>.

THIS page shews the two foliage heads mentioned in the preceding plate<sup>n</sup>, which resemble those already given in Plate 9, and also two academic figures. The shoes worn by the standing one, and the cap of the seated one, shew plainly that these two men were no other than studies from the nude. Moreover, the two slight lines which are marked across the waist of the former seem to be an indentation made by the girdle of his breeches.

These figures, too coarsely true to nature, are valuable because they shew that the study of the naked figure was really carried out by mediæval artists, in order to enable them to clothe and give life to the figures which they carved in doorways and in tabernacles, painted on glass, walls, or on the pages of manuscripts, engraved or embossed on enamelled shrines. Nevertheless, they cared not to exhibit the naked figure, for, with very rare exceptions, their constant theme is the draped figure. And in what a different style do they treat the one and the other? Adam, for example, whether in paradise or not, looks thin and suffering, as if studied from the first model that happened to present himself. The ideal beauty of the antique is not to be found in any of the mediæval forms, but the drapery of their figures seems, by its elevated style, the beauty of its contours, the precision and amplitude of its folds, to be a reminiscence and a reflex of Greek and Roman art, with which it maintains a successful rivalry.

The manuscript of Wilars de Honecort has corrected the modern assertion that the mediæval artists neglected the study of the human form. On the contrary, it shews that they did study it, but with the secondary object of producing draped figures, in which they have admirably succeeded.—(L.)

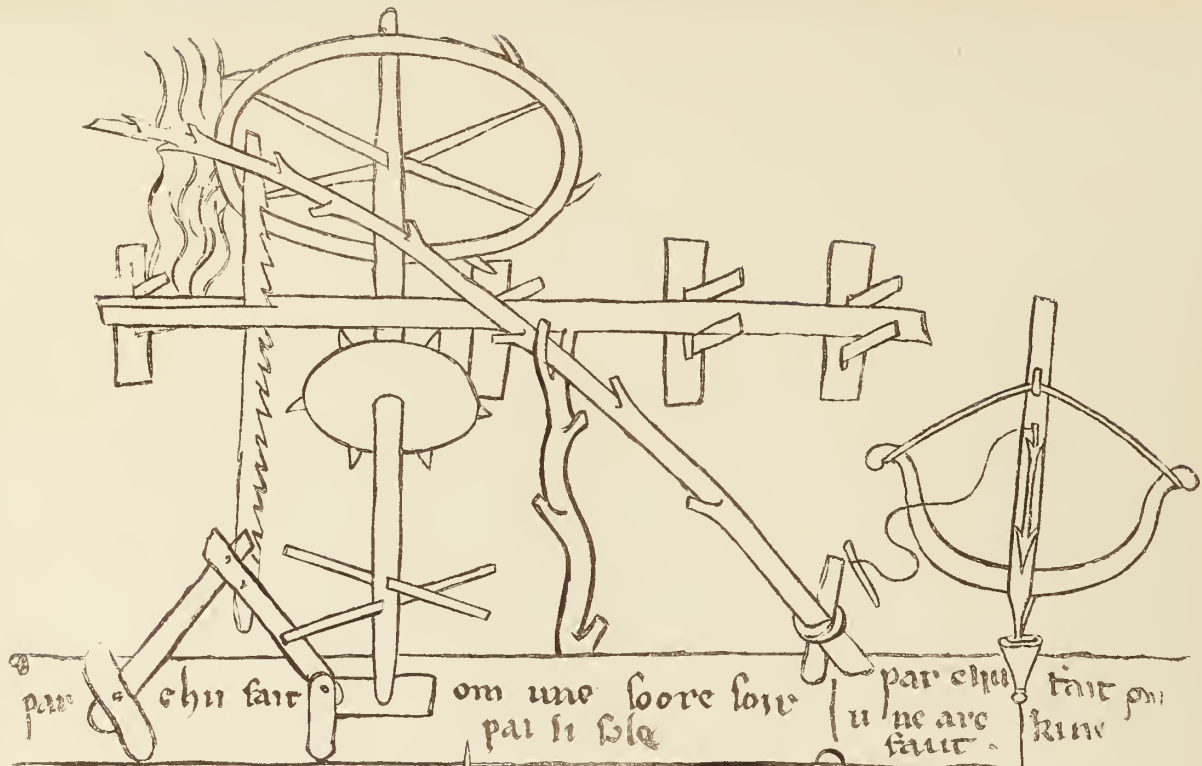
<sup>m</sup> In the French edition, p. 169, this plate is said to be the first of the fifth quire, but as this is inconsistent with the general account of the arrangement of the quires at p. 56 of the same edition, and as the latter coincides with my own memoranda in making Plate 46 the first of the fifth quire, I conclude that the latter account is true, and that the note in which Plate 42 is said to be the first of the fifth quire was

really intended for Plate 46, and has been misplaced in the revision.—(W.)

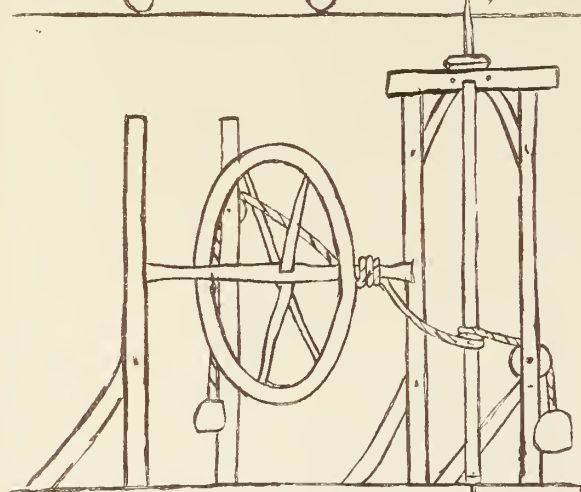
<sup>n</sup> These leaf-heads are certainly a remembrance of antiquity, as already indicated (p. 37), for I have admired lately, in a collection of bronze antiques, two winged masks, a sort of Medusa heads, the cheeks of which were covered with jagged leaves.—(A. D.)



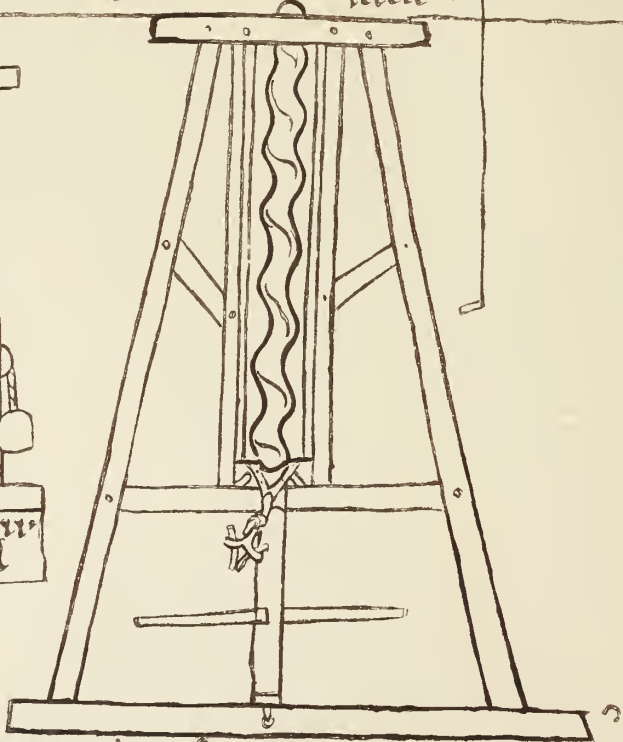




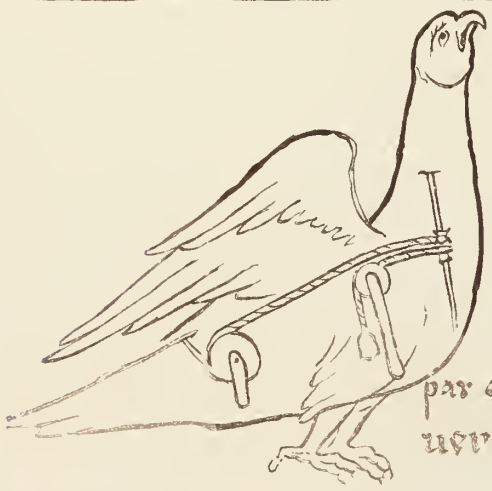
par chu fait om une soore sor  
 par li bla u ne arc fait  
 fait om kine



par chu fait om un angle venir  
 son doit ader uers le solet



par chu fait om on des  
 plus fors engiens ki sont  
 par fait leuer



par chu fait om donner laeste del aquante  
 uers le diachene kant list la  
 uengle



## PLATE XLIII.

## VERSO OF THE TWENTY-SECOND LEAF

“ Par chu fait om une soore soir par li sole.”

“ Par ce moyen fait-on une scie scier d'elle-même.”

“ *How to make a saw saw by itself.*”

A VERY early and rude arrangement for a self-acting saw-mill, so roughly sketched, indeed, that it appears as if from memory, as it can hardly be supposed to be an original design for such a machine proposed by the artist.

The moving power is a current of water which appears in the drawing to run in a direction parallel to the horizontal axis of the water-wheel; but it is probably meant for water falling vertically over the buckets of an overshot wheel. The saw is suspended from a spring pole composed of a slender branch tied at its lower extremity to a stake driven into the ground, and supported midway by a forked post made out of the stump of a tree. The same kind of spring pole is still used in the simple turning-lathe. The lower end of the saw is jointed to an angular frame, which, like the treadle of such a lathe, is formed of two bars of wood jointed separately to posts fixed in the ground, and connected at their extremities.

The mode in which the saw is depressed is as rude as that in which it is mounted, for its motion is caused by four straight arms, which are constructed by fixing two staves in holes bored close together transversely through the water-wheel shaft, which radiate from it, like the spokes of a wheel deprived of its circumference.

The ends of these staves depress in turn the treadle to which the saw is attached, and the spring pole raises it. Thus four cuts are made during each revolution. The timber subjected to the operation lies upon a series of transverse logs, and is guided in its motion towards the saw by passing between two vertical pins inserted in holes in each of the logs. The shaft of the water-wheel carries a small wheel armed with six pointed teeth, which revolves immediately beneath the timber. The latter lies at such a level that the teeth may catch its lower surface and drag it forwards to meet the saw. It is difficult to imagine how this machine could work, unless we suppose the drawing to be a mere diagram sketched from memory, and shewing only the general nature of the train of

mechanism, but omitting many of the connecting parts, and neglecting the exact forms and proportions of the others. In the early saw-mills described by Besson (Plates 13, 14), the timber rests upon rollers, one of which is turned by the machinery so as to advance the log, as in the drawing now under consideration.

Quicherat observes that the invention of saw-mills is of great antiquity, for Ausonius in the fourth century mentions mills for sawing marble on the little river Erubrus, or Arouvre, which is a branch of the Moselle<sup>o</sup>; and Ducange cites several examples of mechanical saw-mills in the middle ages, but all later than Wilars de Honecort. The oldest is one that was purchased in 1303 by the canons of St. Sermin at Toulouse. Two others, about thirty years afterwards, relate to the prohibition of sawing machines. On the other hand, licenses for their construction abound at the end of the same century, especially in Bigorre and in Savoy. The names given to them in the documents are *resega*, *ressia*, *reyssia*, *resea de aqua*, *seyta*, *sciarium*<sup>p</sup>.

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“Par chu fait om une arc ki ne faut.”

“Par ce moyen fait-on un arc infaillible.”

“*A crossbow that cannot miss.*”

According to the explanation given by Lassus, this bow carries at the end of its stock a sight in the shape of a hollow cone pierced at its apex, to allow the marksman to see his aim. The line drawn from the point of the cone to the object is intended to explain this. The aperture of the cone is sufficiently large to allow the arrow to pass through it, and the string attached to the arrow, having a peg tied to its loose end which is too large to pass through the cone, enables the marksman to recover his arrow without having the trouble of hunting for it^q.—(L.)

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“Par chu fait om un angle tenir son doit ades vers le soleil.”

“Par ce moyen fait-on qu’un ange tienne toujours son doigt tourné vers le soleil.”

“*How to make an angel point with his finger always to the sun.*”

In illustration of this proposition, Quicherat remarks that it was common in

<sup>o</sup> The passage is in the *Mosella* of Ausonius, l. 361:—

“ . . . . . ille (Erubrus)  
Præcipiti torquens Cercalia saxa rotatu  
Stridentesque trahens per levia marmora serras.”

<sup>p</sup> Quicherat, *Revue*, p. 74.

<sup>q</sup> He thinks it was a contrivance for beginners, and mentions as unsatisfactory another explanation by which the cone is supposed to rest upon the cross-bow, and be tied to the butt by the string, so that it should be carried away by the arrow when discharged.

the middle ages to place the statue of an angel on the roof of a great church, above the apse. Such a figure existed in this position over the east end of the Cathedral of Chartres before the fire of 1836. It was made of lead and fixed to an axis. Hence the common opinion was that it had been meant for a weather-cock, although far too heavy for such a purpose. He concludes that the true explanation of this axis is to be found in the diagram and legend before us, for as the axis was part of the statue, it would naturally have been left undisturbed when the mechanism was taken away<sup>r</sup>.

The drawing represents a vertical axis or spindle supported by a frame, which also carries a horizontal axis, upon which is a wheel. A cord has a weight suspended to it, and is passed over a guide-pulley, thence horizontally to the vertical shaft, about which it is coiled twice; thence it passes to the horizontal shaft, round which it is coiled three times, and finally is carried over another guide-pulley, and its end hanging vertically down carries a second weight apparently less than the first. Thus, according to the French commentators, the descent of the heavier weight would cause the vertical spindle and the horizontal axis to revolve, so as to cause the statue to perform a single revolution in twenty-four hours.

In this drawing, as in most of the mechanical sketches, the machinery must have been very different in detail from the representations. Whatever may be thought of the skill of our artist in architecture and drawing, it is pretty certain that he had but little technical knowledge of mechanism, and probably made his sketches of machinery from memory. The old kitchen-jack, with its enormous weight descending down the wall of a house, and its regulating fly-wheel, bears the nearest resemblance to this device. But the fly-wheel must have revolved at a much greater rate than this combination would give to produce any regulating effect. It must also be remembered that the motion of a statue, or index, revolving about a vertical axis, so as to point always to the sun, is by no means uniform, being the same as the motion of the shadow of a vertical style upon a horizontal sun-dial, which is not only variable in itself, but changes in amount from day to day as the seasons change throughout the year<sup>s</sup>. Considerable latitude of position may, no doubt, be allowed in the angel's finger; for, viewed from below, it would be impossible to see whether or no it were exactly directed to its object; yet a uniform rotation in twenty-four hours would be a very coarse approximation. I therefore venture the suggestion that the heliotropic angel was not intended to

<sup>r</sup> Vide *Revue*, p. 76. M. Darcel states that Lassus intended to provide clock-work to turn the angel which he had set up over the apse of the Sainte Chapelle at Paris, in imitation of the above device.

<sup>s</sup> An up and down motion of the arm of the angel would also be required to carry out the device completely.—(W.)

be turned automatically, but merely to be shifted at intervals during the day to its proper position by a person appointed for the purpose. The sketch, on this supposition, would represent a convenient mode of turning the spindle; for if the cord, instead of embracing the small diameter of the spindle, as in the rude sketch, were carried round a pulley of considerable diameter fixed to that spindle, the wheel on the horizontal axis would, being assisted by the different diameter of the pulley on its own axis and that on the vertical axis, give sufficient leverage to enable a man to turn the angel spindle with ease and steadiness, so as to set an index attached to it by the help of the sun's rays which were entering the windows of the chamber. The machine is evidently adapted to produce little more than a single rotation of the spindle. It is probable that the motion of the angel was stopped at sunset, and that it was turned backwards, so as to point to the rising of the sun, at some time during the interval between sunset and sunrise; thus imitating the motions of heliotropic flowers, which naturally follow the sun by day and turn backwards by night.

At the present time a man is stationed at the top of the great campanile of St. Mark, at Venice, whose duty it is to strike upon the bell the hour indicated by the clock on the opposite side of the Piazza. Also the office of striking the hours, night and day, is mentioned in 1403 as one of the ordinary duties of the steeple-keeper of Notre-Dame at Montpellier; and in 1410 the high wages of this officer, and his irregularity in striking the time, induced the authorities to order a large clock from Dijon<sup>s</sup>. Probably this method was general before the striking movement of clock-work was invented, and at any rate these examples afford precedents to shew that motions which we now perform by mechanism may have been carried on by an attendant.—(W.)

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“Par chu fait om on des plus fors engiens ki soit por fais lever.”

“Par ce moyen fait on des plus forts engiens qui soient pour lever les fardeaux.”

“*This is the way to make the most powerful engine known for raising weights.*”

A stout frame of carpentry is shewn, in which a vertical axis revolves; the upper part of it is cut into a screw, the lower is left plain, and has a hand-spike thrust

^s Vide Renouvier, *Des Maitres de pierre de Montpellier*, 1844, pp. 96, 197. The duties of this officer are defined in the deed of his appointment. He was steeple-keeper (*custos campanilis*), and hour-striker by day and night (*pulsator horarum, noctibus et diebus*). He sounded the trumpet for the evening and

morning rounds of the town-watch, and kept a lookout against fires, hostile attacks, or other dangers (p. 197). The clock is to have a wooden man called Jacomart to strike the bell (p. 198). Such figures are evidently the representatives of their human predecessors.—(W.)

through it, by means of which it is to be turned. The nut of the screw, which is shewn at the lower end of its course, slides between the two parallel bars of the frame. A hook is suspended from the nut, apparently by a double strap of iron; this hook carries a kind of lewis to grasp the stone or other burden which the engine is required to lift. The lewis consists of three pieces, namely, an iron in the shape of three loops radiating from a centre, the upper loop receives the suspending hook, in the two lower ones are inserted the ends of two other pieces curved and set back to back, in such a manner that by raising the looped-piece the upper ends of the other pieces will be drawn closer together and their lower ends expanded. If a square hole, wider at the bottom than at the top, be cut in a stone, and the ends of the curved pieces dropped into this hole, it will follow that as they expand by the rising of the looped piece they will firmly grasp the stone. This lewis, which I have sketched on a larger scale in the margin, is of a form hitherto unknown, and extremely simple^t. It has escaped the notice of the French commentators of Wilars. Although the lewis is in the drawing hooked close to the nut, it must have been in practice attached to the end of a rope, of which the other extremity was hooked to the nut. When Honecort made his sketch it was probably hung on the nut to keep it out of the way.

That a vertical screw was really employed in the middle ages to raise weights by the traction of a rope fixed to its nut can be shewn from two writers. In the "Mathematical Collections" of Pappus of Alexandria, who lived c. A.D. 390, (Pis. 1602, p. 327,) there is a diagram of such a screw, but the capstan bars are at the upper end of it, and the rope hangs down vertically from the nut through a hole in the frame below, and has a load attached to its lower extremity. Besson, in 1569, gives in Plate 38 a

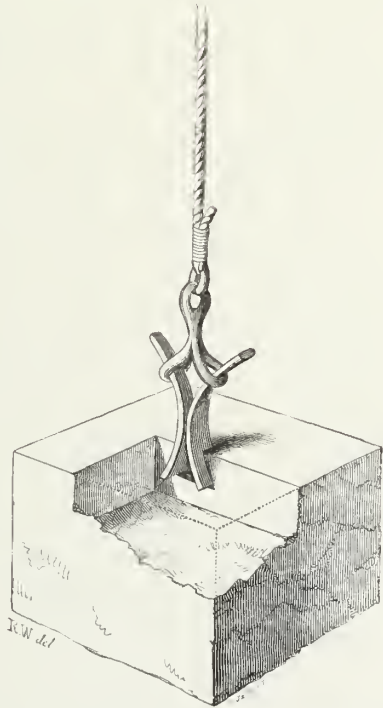


Figure 25.

^t Perrault, in his translation of Vitruvius, (p. 298,) and Piranesi, have collected all the known forms of this instrument (*Louve, Fr., Ulivella, Ital.*), and their results are given, with engravings, by Borgnis. *Traité...de Mécanique...Mouvements des Fardeaux*, p. 311.

Mr. Gibson, in the *Archæologia*, vol. x. p. 123, has

described certain stones which he found in the ruins of Whitby Abbey, each of which had two holes, diverging downwards, bored in their upper surfaces, evidently for the reception of some kind of lewis. These holes would suit Honecort's lewis as well as the single one which I have shewn in the figure.—(W.)

drawing of a vertical screw, with hand-spikes at the lower end, as in Honecort's drawing; the rope tied to the nut is carried upwards nearly parallel to the screw, and when it reaches the top of the frame is diverted into the horizontal course by a guide pulley, and thus along the gib of a crane, at the outer end of which a second pulley turns it downwards to receive the load. This must have been the case with Honecort's machine, for the rope must in all these screw-engines have been carried nearly parallel to the course of the nut, and ought, according to sound principles, to have been double, so as to have been fixed to the nut on two opposite sides, and thus have avoided the lateral twist upon the nut^u.

We now only employ the screw as a raiser of weight in the form of the screw-jack placed under the heavy body, so that the pressure is in the direction of the axis of the screw.—(W.)

~~~~~

“Par chu fait om dorer la teste del aquile vers le diachene kant list la Vengile.”

“Par ce moyen fait-on tourner la tête de l'aigle vers le diacre quand il lit l'Évangile.”

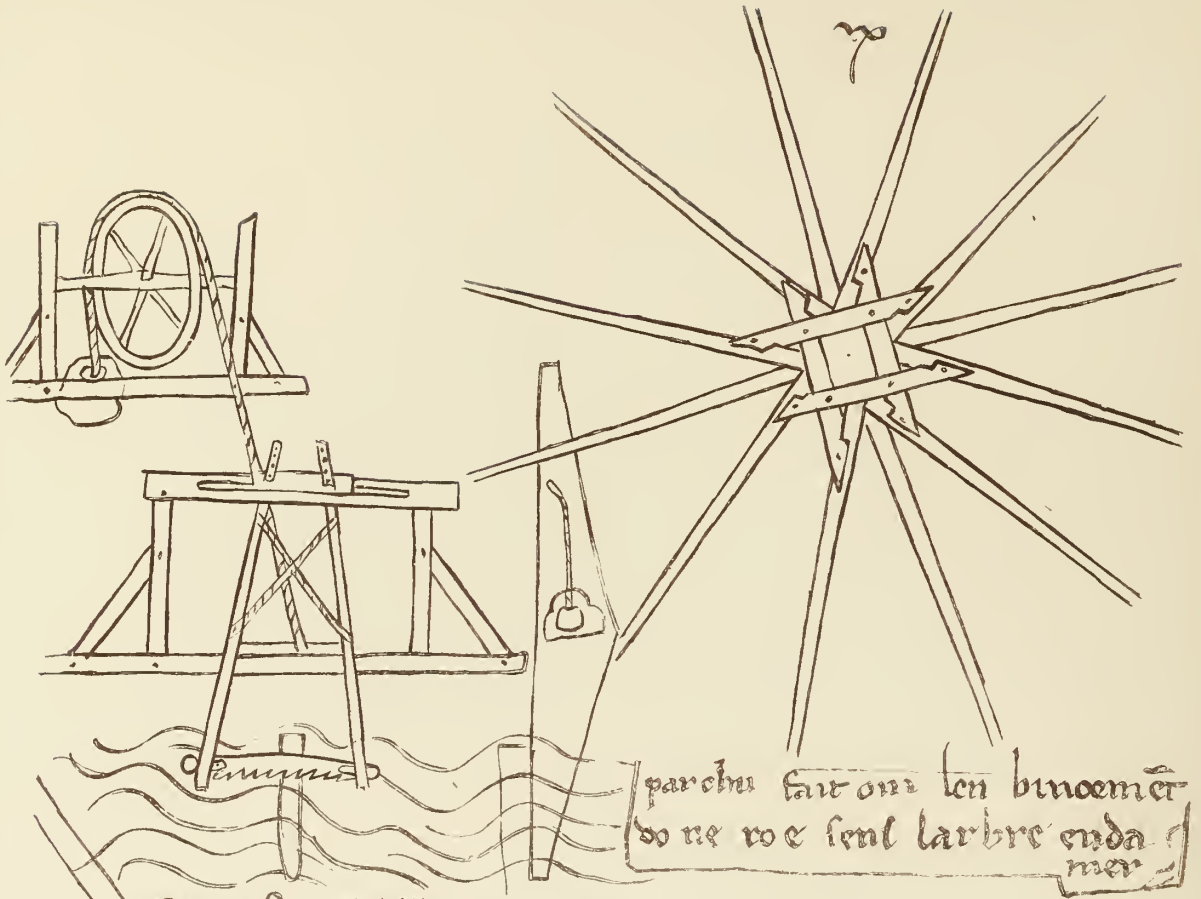
“*How to make the eagle turn his head to the deacon during the reading of the Gospel.*”

A puerile device, which is simply carried out by fixing the head of a brazen eagle and a portion of his neck on a vertical spindle which descends into the hollow body. A transverse axis is conveniently placed near the tail, and a string attached to a pulley upon this axis is coiled round the spindle, and brought back to a second pulley, passed over it, and terminated by a weight tied to its end, which keeps it tight upon the spindle; all this mechanism is within the body. It must be supposed that the end of the axis is brought out at the side of the tail, and furnished with a short lever which is concealed by the desk. Thus the deacon, by depressing the lever, turns the head towards himself at pleasure, and when he releases the lever, the weight in the inside of the bird restores the head to its usual position, in which it looks straight forward towards the east.—(W.)

<sup>u</sup> Besson, in Plate 22, has shewn a pile-driving machine on the same principle. In this the frame with the screw is in an inclined position, so that the rope passing over a pulley at the top of the

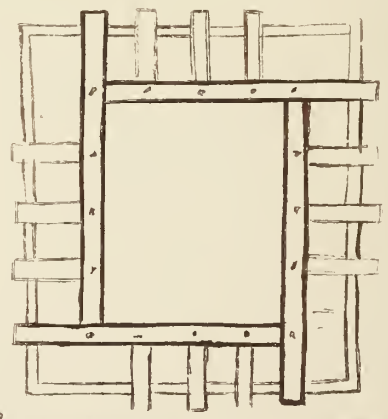
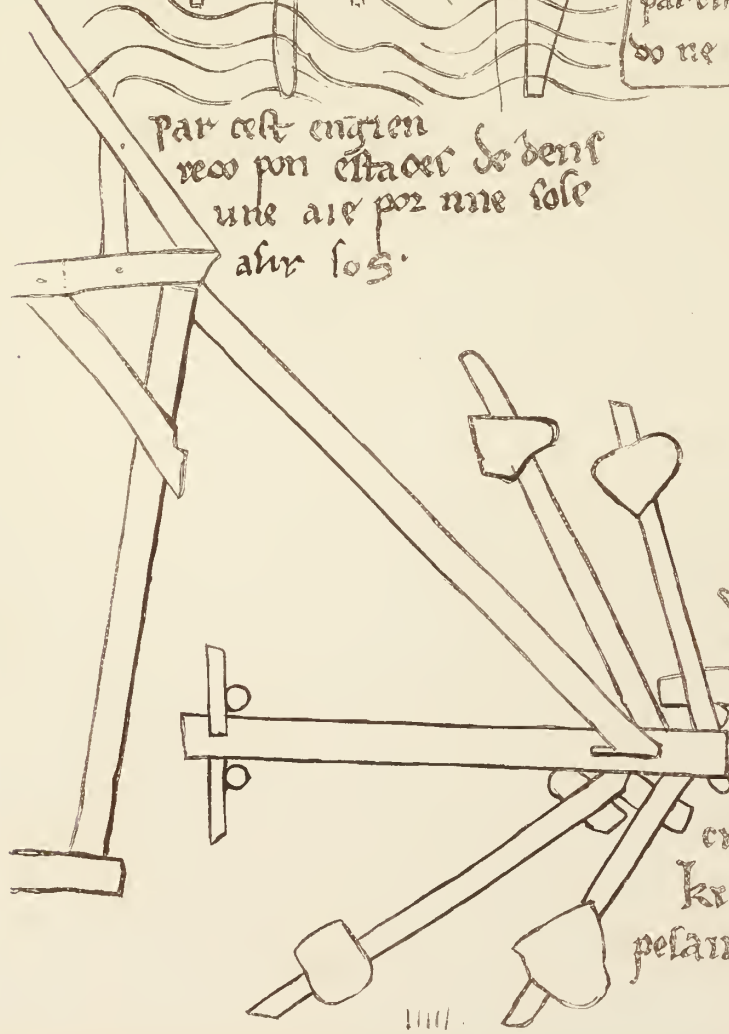
frame is enabled to raise the rammer without the intervention of a second guide pulley. Honecort's frame might have been so placed.—(W.)





parohu fait om ten binoemēt  
do ne ro e sent l'arbre enda  
mer

Par cest engien  
reco pon estacer de dent  
une aie por une sole  
a l'air los.



est si poel ouurer a one roz  
u a one maison de bal  
si sunt trop coz.

par opresse de ceste  
manne poel re dref  
en une maison  
ke pent done part. la si  
pelans ne sera.



## PLATE XLIV.

RECTO OF THE TWENTY-THIRD LEAF<sup>v</sup>, MARKED IN THE FIFTEENTH CENTURY WITH  
THE NUMERAL IX.

“Par cest engien recopon estaces dedens une aie por une sole asir sos.”

“Par cet engin recèpe-t-on les pilotis dans l'eau pour asseoir une plate-forme sur eux.”

“*By this machine the heads of piles can be cut off under water to fix a platform upon them.*”

A SAW is mounted in a frame very similar to that of a modern frame-saw, with cross ropes to tighten it, and a middle stretcher. The upper ends of the frame are inserted through mortices in a cross-piece, and secured to it by pins passing through one of a series of adjustment holes in each. The pile is driven into the stream near the shore, a frame stands above it, and has a slit in its upper horizontal rail through which the cross-piece, to which the frame-saw is pinned, can slide horizontally. It appears most probable that this guide-frame is meant to stand on a stage built temporarily over the water, so as to place the saw-frame in a vertical position above the pile; for if the guide-frame stand on the bank of the river, the saw-frame must slope downwards at a considerable angle. Two men standing in front of the guide-frame would be able to move the saw to and fro. The pressure by which the cut is produced is supplied by a great stone fastened to one end of a cord which is carried over a great wheel mounted on a frame stationed behind the guide-frame. The other end of the cord is tied to the middle stretcher of the saw-frame, and thus presses the saw against the pile. A plumb rule attached to the next pile in the series may be intended to guide the workmen in keeping the saw-frame vertical, and therefore the saw horizontal, so as to cut off the head of the pile truly flat. The pin-holes in the upper end of the saw-frame enable it to be suspended at just such a height as will cut off the pile at the required level, and also all the piles at the same level, as the machine is shifted along the bank.—(W.)

<sup>v</sup> The note in the French edition to the effect that one leaf is wanting between this and the preceding, &c., really belongs to Plate 48, and has been trans-

posed, like the one already described under Plate 42.—(W.)

“ Par chu fait om lenbracement done roe sens larbre endamer.”

“ Ainsi fait-on l’embrassure d’une roue sans entamer l’arbre.”

“ *In this manner the spokes of a wheel may be braced without cutting into the shaft.*”

The drawing sufficiently explains the system proposed, and appears to need no description.

~~~~~

“ Par copresse de ceste manine poes redrescir une maison ki pent done part. ja si pesans ne sera.”

“ Par un étau de cette façon vous pouvez redresser une maison qui penche d’un côté. Elle cessera d’être aussi pesante.”

“ *By a shore of this kind a house which leans forward can be set upright, and will no longer tend to fall.*”

The lower end of the shore is inserted in, or stepped into, a mortice at the end of a horizontal beam or sleeper, which is prevented from slipping forwards by a transverse pin which is passed through its tail and rests against two stakes driven into the ground.

Four rude levers are brought to bear beneath the outer extremity of the sleeper, each having a stone for its fulcrum, and its outer end loaded with another great stone. It must be supposed that when the sleeper has been raised as high as the levers will carry it, it must be wedged up, and the fulcra of the levers also raised, and then the operation be repeated, and so on until the front of the house be restored, step by step, to its vertical position. The principle of this operation is perfectly correct, and it is worth remarking that the same system was employed in 1739 to restore the north gable wall of the transept of Beverley Minster. This wall overhung its base four feet, and was bodily pressed back to its vertical by a timber framing constructed on a similar principle to that shewn in the rude drawing now before us. Screw-jacks were employed instead of levers to raise the horizontal sleepers; the horizontal sleeper and the inclined shore were, however, connected by proper framing, so as to form a solid, well-trussed piece of carpentry.—(W.)

~~~~~

“ Ensi poes overer a one tor u a one maison de bas si sunt trop cor.”

“ Ainsi vous pouvez travailler à une tour ou à une maison avec du bois même trop court.”

“ *By this device you can work at a tower or a house with timber which is too short.*”

THIS is a well-known system for laying a floor or a scaffold with beams that

are too short to extend from one wall to the other, and are therefore so arranged that one end of each beam rests in the wall, and the other upon the next beam in order. It was first published, as far as I know, in the first book of the Architecture of Sebastian Serlio (1545), and is now familiar to us. Our author appears to have applied it in this case to a gallery floor or to a scaffold for working at the walls of a tower or other building. For the latter purpose the short beam would have the convenience of being easily drawn out of the one putlog-hole in the wall by which its end is supported.—(W.)







## PLATE XLV.

## VERSO OF THE TWENTY-THIRD LEAF.

THE figure of a man seated on the ground, his head leaning on his right arm, by which it is concealed; he is seemingly asleep. This may be a study of an Apostle to form part of a picture of Christ in the Garden of Gethsemane. Its style savours of Germany, like the figure of Jesus prostrate in Plate 32, which may well be the companion sketch to this.

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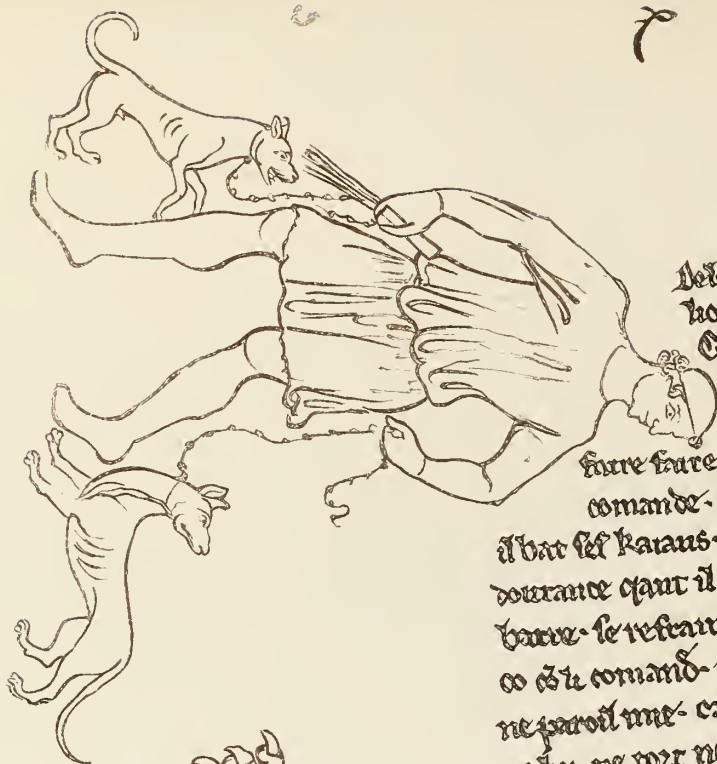
A side view of a warrior with his foot in the stirrup, preparing to mount his horse, (which is represented so exactly in full face, that an architect might term it a front elevation of a horse). The warrior is clothed very much after the fashion of the one in Plate 3. A *cotte d'armes* with short slashed sleeves covers a hauberk of mail, the hood of which is hanging down his back. His arms, hands, legs, and feet are clad in mail, that of the legs and feet being laced. He wears the little tight cap, or *béguin*, so common in the representation of the costumes of artizans in the thirteenth century, and carries a large sword on his left side. There is nothing remarkable in the horse's harness, excepting the length and wide separation of the branches of the bit.—(L.)







7



De l'enlaignement del  
 hon il uel se pleir.  
 Car q' le ho doctrine  
 il a .ij. charaus  
 quant il uert le hon  
 faire faire auerue coze se le  
 comande. se li honf groigne.  
 il bat les karais. dont a lions sur  
 dourance quant il uort les karais  
 batre. se restant s'ozage z fait  
 oo es li comand. z fil est oze ces sozoo  
 ne paroil me. car il ne ferit pas  
 ne bn ne vort ne deort. z bien faces  
 q' cel honf fu comeres al vit.



H  
 O  
 O



## PLATE XLVI.

RECTO OF THE TWENTY-FOURTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE ROMAN NUMERAL X. THIS LEAF IS THE FIRST OF THE FIFTH QUIRE<sup>s</sup>.

“De l'enseignement del lion vus vel ge parler. Cil qui le lion doctrine il a. ij. chaiaus<sup>t</sup>. Quant il velt le lion faire aucune coze se li comande. se li lions groigne. il bat ses kaiaus. dont a li lions grant doutance quant il voit les kaiaus batre. se refraint son corage et fait co con li comand. et sil est corecies sor co ne paroil mie. car il ne feroit por nelui ne tort ne droit. Et bien sacies que cil lions fu contrefais al vif.”

“Je veux vous parler de l'éducation du lion. Celui qui dresse le lion a deux petits chiens. Quand il veut faire faire une chose au lion, il lui commande. Si le lion grogne, il bat les chiens. Le lion a si grande perplexité quand il voit battre les petits chiens, qu'il refrène son humeur et fait ce qu'on lui commande. Et s'il est courroucé, sur cela je ne parlerai point, car il ne ferait rien ni par bon, ni par mauvais traitement. Et sachez bien que ce lion a été dessiné sur le vif.”

*“I am going to tell you how a lion is trained. His master brings two young dogs. When he wants to make the lion do anything, he commands him to do it. If the lion growls, he beats the dogs. The lion is so perplexed when he sees the dogs beaten, that he refrains his ill-humour, and does as he is bid. But when he is really enraged, there is no help for it, for, right or wrong, he will do nothing for anybody. Remember that this lion was drawn from life.”*

THE drawing represents a lion chained to a picket, and distinguished by the name LEO, carefully written in large capitals over his back. His master stands before him, holding two dogs in a leash, with a rod in one hand to flog them with. Above is a sketch of the head of a lion with his jaws open. This mode of training lions resembles the educational method employed in the olden time for the sons of great lords, with whom a school-fellow, termed a whipping-boy, was kept, and received all the corrections deserved by their own misconduct. Perhaps the lion having been once beaten for disobedience, was kept in fear of further chastisement by seeing the little dogs beaten instead of himself.—(L.)

<sup>s</sup> Vide note to Plate 42.—(W.)

chienne; il signifie aussi la progéniture de tout autre

<sup>t</sup> CHAIAUS, chien; *canis*. CHAIAUX, petit chien, petite animal.—(Roquefort.)





# LEO

Le lion se com  
en le roie p deuant  
& saes bien qd se  
contrefais al roy



Le lion se com  
cest une bestiole  
q lance se soit qant  
ele se corce.



## PLATE XLVII.

## VERSO OF THE TWENTY-FOURTH LEAF.

“Vesci .i. lion si com on le voit par devant et scacies bien quil fu contrefais al vif.”

“Voici un lion tel qu'on le voit par devant, et sachez bien qu'il a été dessiné sur le vif.”

“*This is a lion as he is seen when viewed in front, and take notice that it was drawn from the life.*”

WILARS DE HONECORT is so anxious to avoid the supposition that his two figures of lions are drawn from imagination, that he again mentions that he drew them from nature. This fact, without his assurance, would hardly have been suspected, for never did nature give to the king of animals a body so rounded or a face so human as those which he has assigned to him. M. Lassus states his belief that they were traced from memory.

~~~~~

“Vesci .i. porc espi. cest une biestelete qui lance se soie quant ele est corecie.”

“Voici un porc-épic : c'est une petite bête qui lance ses soies quand elle est courroucée.”

“*This is a porcupine. It is a little animal which shoots forth its quills when it is angry.*”

Manifestly Wilars de Honecort had been visiting some menagerie of rare beasts when he drew these pages of his Album; for the porcupine is not of our climates, and is not mentioned in any Bestiary. In the middle ages, as in the present day, travelling caravans must have followed the large fairs by which the principal commerce of the period was carried on, and we remember to have seen in a magnificent manuscript of Matthew Paris in the British Museum a drawing of an elephant that was in London at the end of the thirteenth century. It has been long believed that the porcupine discharges its quills to defend itself against the attacks of its enemies.—(L.)



PLATE XLVIII.

RECTO OF THE TWENTY-FIFTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH
THE NUMERAL XII.

Between this leaf xii. and the preceding one which is marked x., one has been abstracted, and as the series of fifteenth century numerals shews that it must have been marked xi., its abstraction was subsequent to that paging.—(W.)

A PERSONAGE seated, dressed in a robe and mantle, his head covered with a low-crowned head-dress, his feet shod. This is perhaps a figure of Pilate dismissing Christ to Caiaphas.—(L.)



PLATE XLIX.

VERSO OF THE TWENTY-FIFTH LEAF.

THE figure of an old and bearded man clothed in a robe and mantle, his feet shod, and holding a disk in his hands.

Were it not that apostles are usually characterized by bare feet, this figure might have represented one, holding a consecrating cross, like those in the Sainte Chapelle, but it may be intended for a prophet, the disk having probably borne some prophetic emblem of Christ or of the Virgin.



Two foot-soldiers; the one, an archer, has just discharged an arrow; the other, who wears a sword, holds the handle of a long lance. Both are dressed in the *bliant*, or blouse, gathered in at the waist, and have *bas de chausses*. One wears short boots, the other simple shoes. The belt of the sword is of the usual form seen in sculptures or paintings; it was not fastened by a buckle, but one end of it was formed into an eye, and the other, by being tapered to a thong, enabled them to be tied together.—(L.)

201

PL.L

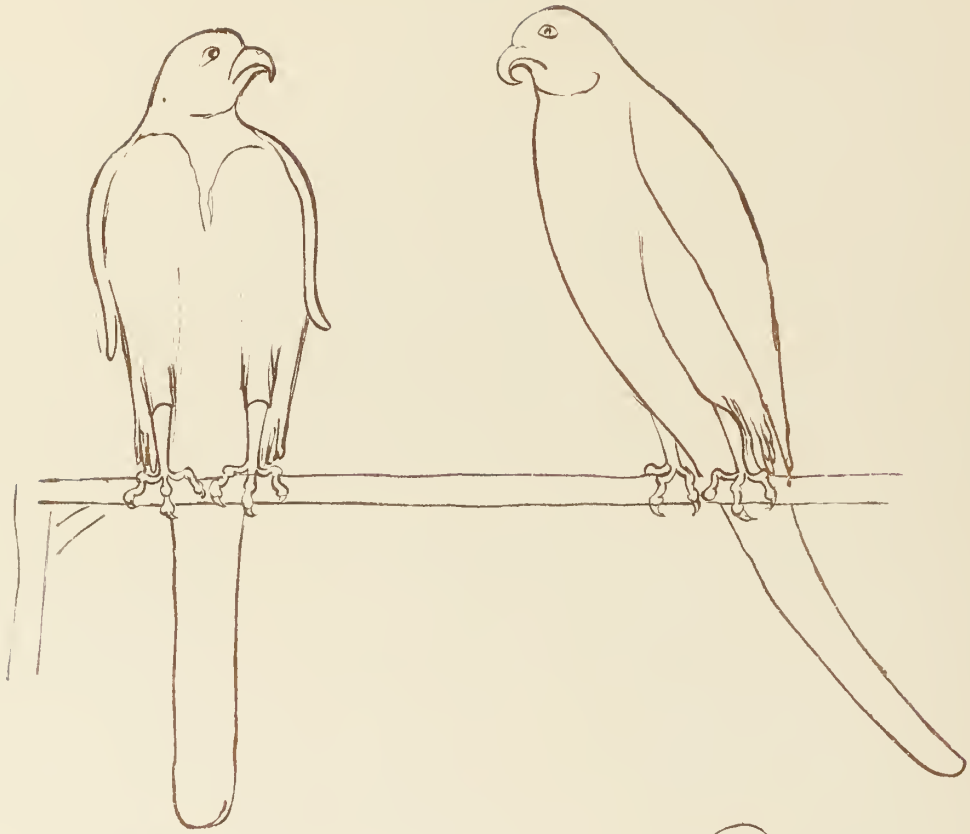


PLATE L.

RECTO OF THE TWENTY-SIXTH LEAF, MARKED IN THE FIFTEENTH CENTURY
WITH THE NUMERAL XIII.

Two popinjays, or parroquets, on their perch, memorials probably of the menagerie which has already furnished the lion and the porcupine.

These studies were, perhaps, made with a view to employ them in the composition of designs for weaving or embroidery, in which rare or curious Eastern animals are often represented.

~~~~~  
A minstrel playing on a viol, making a dog dance on its hind legs. The man is naked, and indicated by a mere outline †.

~~~~~  
A woman holding a parroquet on her wrist, whilst a dog, on its hind legs, is barking at the bird. This figure, like the preceding, is chiefly indicated by outline, the fingers, toes, and partly the features, being suppressed.—(L.)

The two groups may be considered as one composition, consisting of a minstrel with two dancing dogs, and a woman looking on. The man and woman are precisely in the same attitude, but in reverse directions, according to Honecort's usual practice, and the same may be said of the dogs, only that their heads are turned the same way. The parroquet on one side even corresponds to the bow on the other by its symmetrically opposite inclination.—(W.)

† Compare this figure with the man drawn on geometrical principles at the left-hand lower corner of Plate 34.—(W.)



PLATE LI.

VERSO OF THE TWENTY-SIXTH LEAF.

THREE groups, each composed of a man combating a lion. In the first, the lion is rushing on the man, who receives him with his arm wrapped up in the mantle, and prepares to strike him with his raised sword. In the second group, the man with naked feet and legs, and armed with a round buckler and a lance, is piercing the lion who is raised against him. In the third, the man is thrown on his back; with one hand he has transpierced the lion with his sword, whilst with the other he is grasping the paw of the lion, who is about to tear him to pieces. These groups may be the development of an imaginary combat between a man and the lion of the preceding plates, or rather, Wilars de Honcourt may have copied some ancient consular diptych representing, at its lower part, the combats of the circus.—(L.)

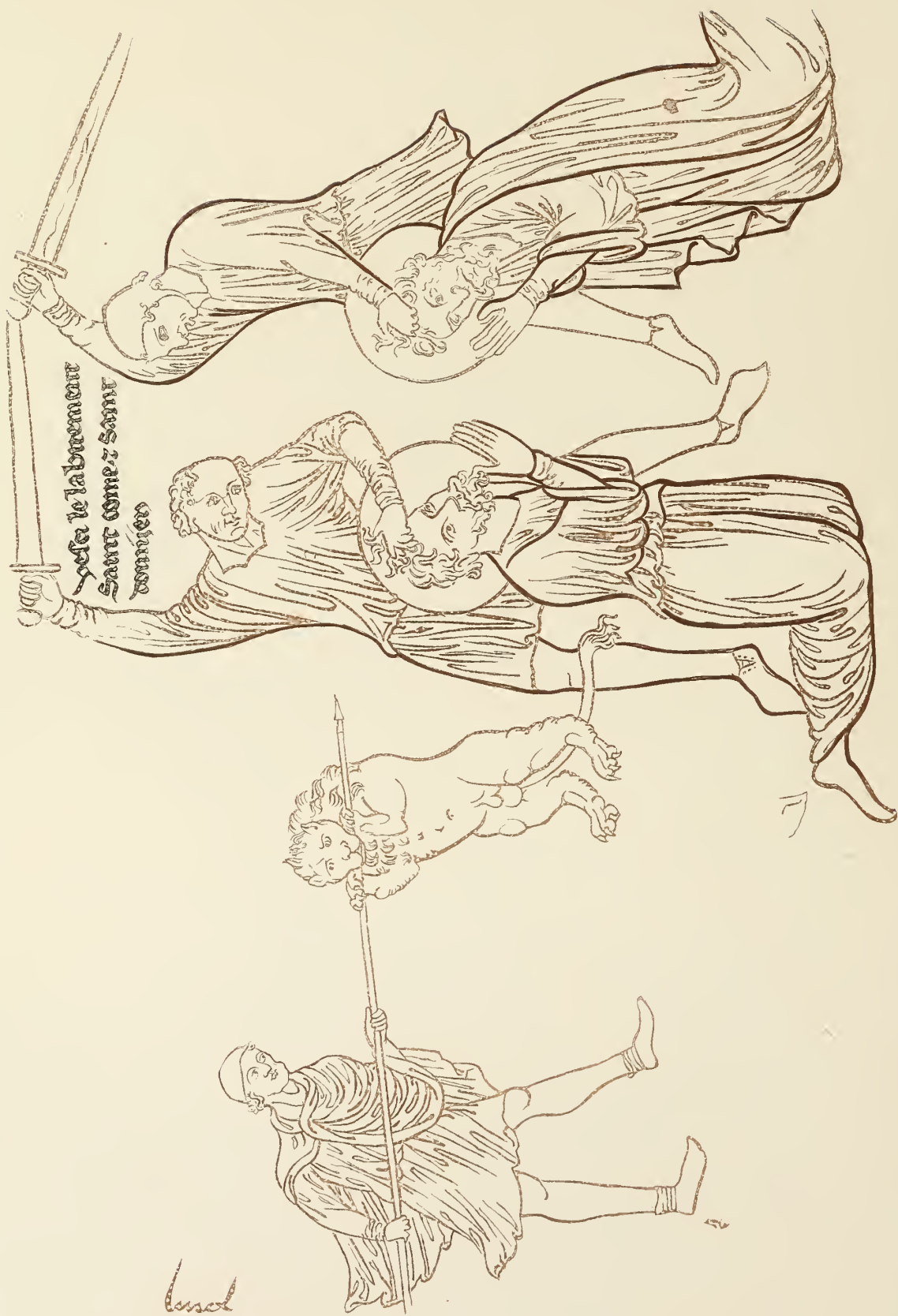


PLATE LII.

RECTO OF THE TWENTY-SEVENTH LEAF, MARKED IN THE FIFTEENTH CENTURY
WITH THE NUMERAL XIII.

A MAN fighting with a long pike against a lion. An evident continuation of the scenes represented in the preceding plate.

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“Vesci le labitement saint Come et saint Domiiien.”

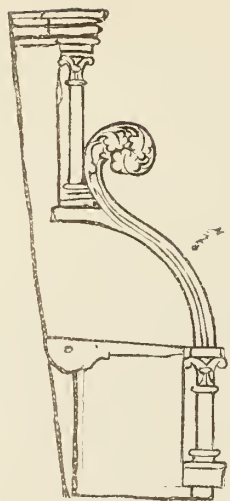
“Voici le martyre de saint Côme et de saint Damien.”

“Behold the martyrdom of St. Cosmas and St. Damian.”

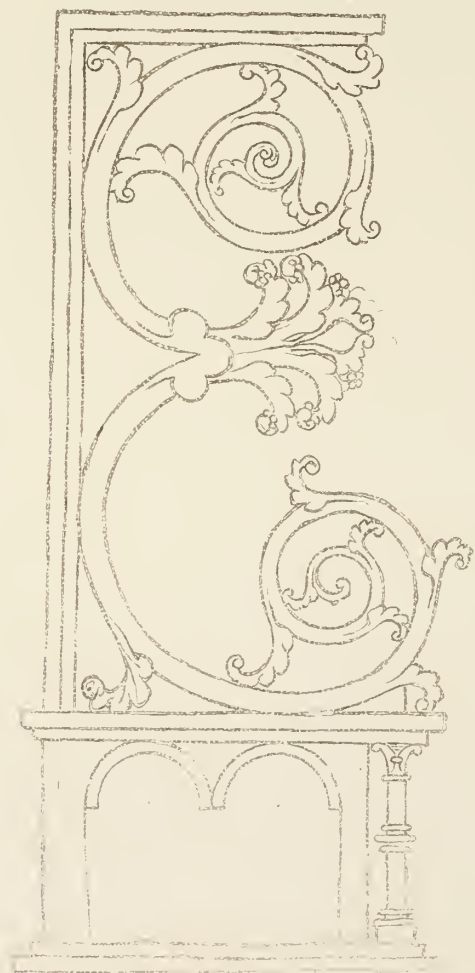
Each of the two nimbed saints is kneeling before an executioner, who is grasping the hairs of his head with the left hand, and in the right brandishing the sword with which to decapitate him.

The only remark to be made on the costume of the executioners is, that their shoes are laced at the side and on the inside of the foot.

Wilars de Honecort seems to have gone over the contours with darker ink than that which he used for tracing the design. He appears to have done this when he wrote the legends of the different subjects, as these legends are generally in much darker ink than the drawings.—(L.)



Veste une legiere poupee d'un  
estaul a. r. entrecloz atore le clef.



## PLATE LIII.

VERSO OF THE TWENTY-SEVENTH LEAF.

“Vesci une legiere poupee duns estaus a .i. entreclos a tote le clef<sup>u</sup>.”

“Voici une poupée simple d’une stalle à cloison avec la clef.”

“*Here is an easily made poupée for a stall, together with one partition and the clef.*”

THE inscription applies to the drawing above as well as to that below. The latter represents the carved high standard which terminates a range of stalls; the former is the ordinary partition which separates every stall from the next, and is in modern French joinery termed the *parclose*. In Plate 56 there is another rich design for the terminating standard, to which the word *poupée* is applied. This shews that in the above inscription the word *poupée* designates the standard, and consequently *entreclos* is the partition. We also learn that the “poppy” is the entire standard which forms the end of a bench, or of a range of stalls or substalls; and that the florid ornament to which in England the terms “poppy” and “poppy-head” have hitherto been indifferently applied<sup>x</sup> can only claim the latter as being the *head* of the former. The *clef* of the *entreclos* is the richly-molded cap which receives and supports it, and is curved backwards to form a convenient elbow and leaning-place. The modern French joiners term this *clef*, the *museau*, muzzle, or nosing.

Lassus remarks that this *poupée* is of the same form as in the stalls of St. Géréon at Cologne, with only the difference that in the latter a statue is added in front of the double volutes<sup>y</sup>.—(W.)

A personage, probably intended for our Saviour, is standing in robe and mantle, the latter gathered up under the left arm<sup>z</sup>, and is giving a blessing in

<sup>u</sup> According to Roquefort, (Glossaire de la langue Romaine,) A was sometimes used in the sense of *avec*. “Le duc. . . qui as eschees joua A Jehan de Chandos, &c.” In this sense it must be taken in the above inscription, “a I entreclos.” *Atote* is *Atout*, *Avec tout cela*, as *atout un homme*, avec un seul homme; i. e. *with only one man*; *estaus*, or *estaulx*, is *stalle d’église*. Quicherat, and after him Lassus, translate the inscription, “Voici une légère poupée d’une stalle à cloison avec la clef.”—(W.)

<sup>x</sup> “POPPY, POPPY-HEAD, &c., an elevated ornament often used on the tops of the upright ends, or elbows, which terminate seats.” (Oxford Glossary.) The popit-heads of a common turning-lathe may be cited as another instance.

<sup>y</sup> These stalls, which were made in 1469, by Georgius Sulin, are engraved in the ninth volume of the *Annales Archéologiques*, p. 141, and in Gailhabaud’s *Architecture*, t. iv.—(W.)

<sup>z</sup> The small object grasped in the left hand is shewn

the Latin form, or rather speaking, for He is represented as during His earthly mission. In the manuscript the drawing is inverted, the features scarcely indicated, and the whole traced with a very fine pen and with great lightness of hand.—(L.)

by comparison with the second figure in the succeeding plate to be the coiled end of a label, the remainder of which may be traced, passing round the body, and under the right arm.—(W.)







## PLATE LIV.

RECTO OF TWENTY-EIGHTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE NUMERAL XV.

WE have inverted this plate, in order to give greater facility for studying it; for, in the manuscript the two draped figures it represents are turned a different way to all the others, like that in the preceding plate, which belongs to the same sheet.

One of the figures is a young man with bare feet, who may be an apostle; the other, aged, bearded, and apparently shod, is speaking and holding a label; he may be a patriarch; that is, if we are to attach any importance to the character implied by the non-nudity of the feet. In a painting, or a piece of finished sculpture, the Deity and the Apostles only would be represented bare-footed, but in these sketches, where sometimes the hand is only marked by its general contour, it is just possible the feet may have been dealt with in the same way. And yet the outline of the bare feet is indicated in a different manner from those that are shod, as may be seen in the following plate. Nevertheless, in these two figures, studied with so much care in their physiognomies, their attitudes, and in the folds of their drapery, the artist would scarcely have represented the one bare-footed and the other seemingly shod without some intention. The hose which cover the legs of the supposed apostle are worth a moment's attention. This part of the costume, which we have never seen employed in the clothing of a Scriptural personage, may shew that these sketches were partly studied from nature.

The style of the drawings bears the impress of the school of Cologne, like some previous ones already pointed out.—(L.)





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## PLATE LV.

## VERSO OF THE TWENTY-EIGHTH LEAF.

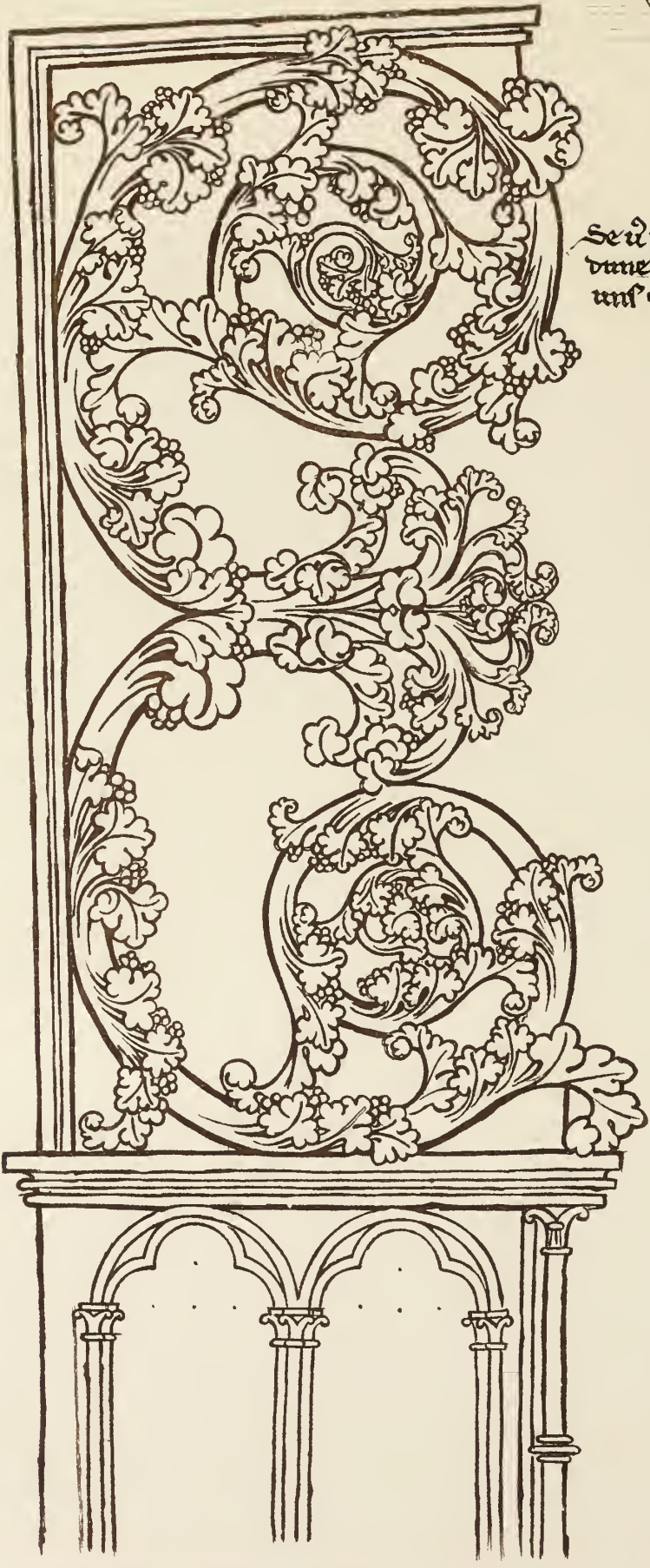
THE upper group represents the scourging of Christ; the lower, Christ returning to Pilate after the scourging. The two soldiers that have struck Him, still bearing the scourges, walk before. The Saviour, naked, with the exception of the loins, and having His hands tied, is conducted by two other soldiers.

These are simple sketches, for the most part, without indications of the features, the clothing and the limbs being also mere contours. A few folds of the clothing are marked. The nimbus of Christ is formed by several dots placed in a circle, and is not cruciform.

The designs would suit either painted glass or sculpture.—(L.)







Se u' uoies bien ouer  
d'une bone poupee n  
un' estaul a cest u' rene



## PLATE LVI.

RECTO OF THE TWENTY-NINTH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH  
THE NUMERAL XVI.

“Si vus volez bien ovrer dune bone poupee a uns estaus a cesti vus tenes.”

“Si vous voulez bien ouvrer à une bonne poupée pour une stalle tenez-vous à celle-ci.”

“If you have occasion to make an excellent poppit for stalls, take this design.”

THE page is wholly occupied by a large and elaborate drawing of a carved stall-poppit, the general design of which is the same as that of Plate 53, but the foliage is much richer, and the arcade below has more architectural members. The former sketch was called a *legière poupée*, this is a *bone poupée*. Quicherat has shewn that in accordance with the usual acceptation of the adjective *lèger* in the ancient language, the former would be rendered as *facile à faire*, “easy to make<sup>x</sup>.” The “bonne poupée,” on the other hand, is meant to be as good as possible without regard to cost or pains. Lassus informs us that the stalls of Notre-Dame de la Roche have some analogy to these, and directs attention to the care with which the foliage is spread, so as to present many points of contact and ensure solidity to the whole.—(W.)

<sup>x</sup> *Revue*, p. 223.



## PLATE LVII.

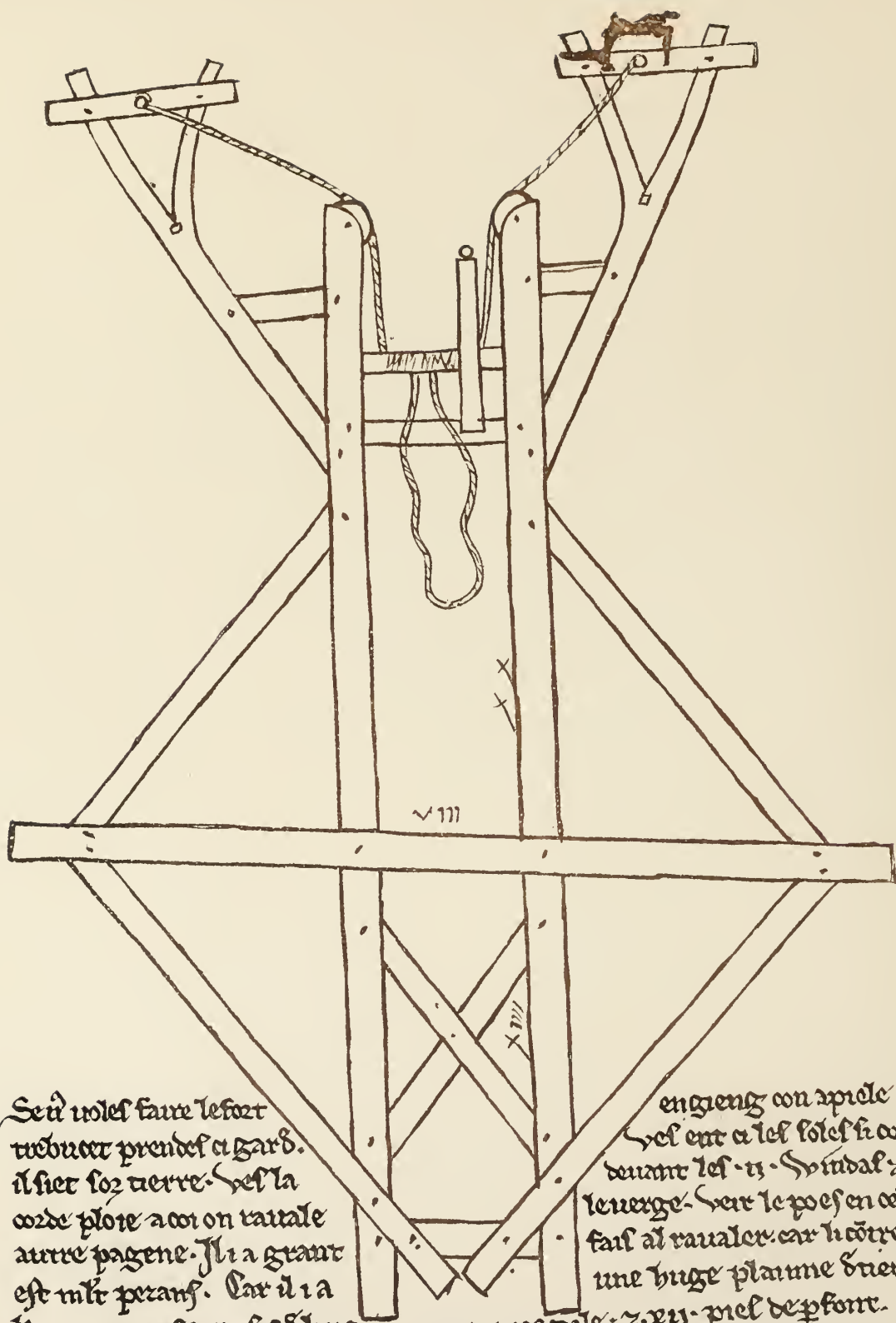
VERSO OF THE TWENTY-NINTH LEAF.

A MAN with no other clothing than a *chlamys*, or antique scarf, knotted on his right shoulder, and a skull-cap on his head.

M. Duchalais considered this figure to have been a free copy of an antique Mercury. Several ancient manuscripts of Terence represent slaves in this costume, so that we have a double reason for assigning a classical origin to this singular production of our thirteenth-century artist.—(L.)







Se u' uoies faire le fort  
 uebuert prendes ci gard.  
 il fiet soz terre. Des la  
 corde ploie a coi on raitale  
 autre pagene. Il a grant  
 est mlt perans. Car il i a  
 ki. u. grans torres a blonc z.  
 viij. pies dele. z. xij. pies de pfont.  
 s'z al des cocier dele fleke pensef. z. si u' en donef gard.  
 a cel estancon la devant.

engiens con apiele  
 Des ent a les loles si com  
 deuant les. ij. Soindal z. le  
 leuerge. Ser le poef en cele  
 fait al rualer. car h'cōtrepois  
 une huge plainne d'uerre.

## PLATE LVIII.

RECTO OF THE THIRTIETH LEAF, MARKED IN THE FIFTEENTH CENTURY WITH  
THE NUMERAL XVII.

The preceding leaf was taken out before the paging of the fifteenth century was added.

~~~~~

“Se vus volcs faire le fort engieng con apiele trebucet prendes ci gard. Ves ent ci les soles si com il siet sor terre. Ves la devant les .ij. windas et le corde ploic a coi on ravale le verge. Veir le poes en celc autre pagene. Il i a grant fais al ravaler. car li contrepois est mult pezaus. Car il i a une huge plainne de tierre. ki .ij. grans toizes a de lonc et .viii. pies de le.^y et .xij. pies de profond. Et al descocier de le fleke penses. et si vus en donez gard. car ille doit estre atenu a cel estancon la devant.”

“Si vous voulez faire le fort engin qu'on appelle trébuehet, faites iei attention. En voiei la plate-forme telle qu'elle pose à terre. Voiei devant les deux ressorts et la eorde détendue, avec laquelle on ramène la verge, eomme vous pouvez le voir en l'autre page. Il y a un grand poids à ramener, ear le contre-poids est très-pesant, étant une huehe pleine de terre. Elle a deux grandes toises de long, neuf pieds de large et douze pieds de profondeur. Pensez au jet de la flèche et prenez-y garde, ear elle doit être posée eontre la traverse de devant.”

“If you desire to make the strong engine which is called a trebuchet, pay attention to these pages. This is the sole (or frame of the base) just as it rests on the ground. In front are seen the two capstans, and the doubled rope by which the verge^z is hauled down. This you can see in the other page. The hauling down of the verge is a serious affair, for the counterpoise is very heavy. For it is a chest full of earth, which is two great toises (twelve feet) long, and nine feet broad, and twelve feet deep. Consider also the unlocking of the detent, and take heed thereto, for it must be attached to the stanchion in front.”

THE trebuchet is a projectile machine employed in the middle ages to throw large stones by means of a sling. It appears to have continued in use long after the invention of gunpowder, even to the fifteenth century^a, and many repre-

^y LE . . . large, largeur, &c.—Roquefort.

^z *Verge* being an old English word for a pole or rod, as in the term *verger*, the staff-bearer of a cathedral, &c., it is allowable and convenient to retain it in designating the characteristic lever of the trebuchet. It was also applied to the shaft of a column. Vide Parker's Glossary, art. VERGE.—(W.)

^a The trebuchet appears to be the same as the “engin a verge,” which was used in company with bombards in the middle of the fifteenth century. Vide Grose's *Military Antiquities*, vol. ii. p. 304; which also contains some engravings of these machines copied from various sources.—(W.)

sentations of it are preserved in manuscripts of the fourteenth century, and in the woodcuts of Valturius and the early editions of Vegetius. Its general form and principle is well known, but the particular machine which Honecort has drawn differs from the usual arrangement, and therefore requires to be examined. The unfortunate loss of one of his drawings on “*cele autre pagene,*” which has been abstracted, leaves much to conjecture^b.

I have embodied the result of my own cogitations on the subject in the subjoined sketch (fig. 26). It represents Honecort’s trebuchet as I suppose it to have been arranged as a machine. But I have not attempted to give to the framing a mediæval character, and indeed, with a view to shew clearly the essential parts, have omitted many subordinate braces and framing-pieces, which in so large a machine must needs have been introduced.

The base frame of the machine in the sketch is drawn in exact accordance with Honecort’s plan, the superstructure designed by comparing that plan with the other representations of trebuchets that have remained to us, and by considering the action of the machine. The Roman numerals in the plan are manifestly dimensions written on the pieces they belong to. The long parallel sleepers are thirty-four feet in total length; that is, twenty feet from the pulley to the transverse piece, and fourteen feet from thence to the end, and the sleepers are eight feet apart.

^b The article descriptive of this plate in the French edition takes a totally different view of the machine in question from that which I have ventured to offer. The word *fleke*, which I have referred to the detaining bolt, is supposed to be the *arrow* discharged by the machine, which is thus made to perform a function for which it is wholly unfitted. Strangely enough, the common French word *vindas* is translated *ressort*, and the forked frames which I have supposed to be the foundations of the two capstans are viewed as wooden springs to which the ends of the double rope are tied fast. The transverse roller round which the rope is coiled in its passage is supposed to be the barrel of a windlass, and the post or staunchion with the ring at its top is interpreted to represent the wheel which is attached to the barrel. The explanation proceeds by stating that previously to attaching the downhauler to the verge, the barrel of the windlass must be turned the reverse way, so as to bend the springs. Then the downhauler being hooked to the verge, and the windlass turned in the proper direction for hauling down the verge, the springs by unbending themselves will assist the men in raising the weight. This assistance is

greatest at the beginning of the operation, and diminishes as the springs unbend. But as at the beginning the rope and the verge make an acute angle, the effort of the rope will be less for raising the weight than afterwards, as that angle is increased by the change of position of the verge in descending. Thus the springs will compensate for this variation, according to the French editor. But it may be replied that the action of the weight is still more variable than the angle of the rope, and supplies a compensation of the same kind as that above described, which makes the springs wholly unnecessary, and worse than useless. For by hanging vertically downwards from the axis of the verge at the beginning of the downhauling, the weight opposes no resistance to the first effort, and its mechanical action gradually increases as it rises.

Besides this inadvertence, the whole explanation appears to me to be so unsatisfactory, that I have had no hesitation in substituting the article in the text for that of the French edition, with which it has nothing in common except the two woodcuts, figs. 28 and 30.—(W.)

For the comparison of this engine with the more common form, three illustrations from manuscripts of the fourteenth century are added below. The principal agent of the trebuchet is the *verge*, a long straight lever, to which is fixed an axis at a point that divides the length into two unequal parts, or arms. The short arm of the verge is accordingly thick and strong, and the long arm gradually tapered from the axis to the extremity.

From the short arm is suspended a chest, or other receptacle, roughly constructed of boards, and, as Honecort tells us, filled with earth, or, of course, with stones, gravel, or sand, as most convenient. In the vignette from the *Roman d' Alexandre* (p. 200 below), it resembles a tub with hoops. In nearly all the drawings

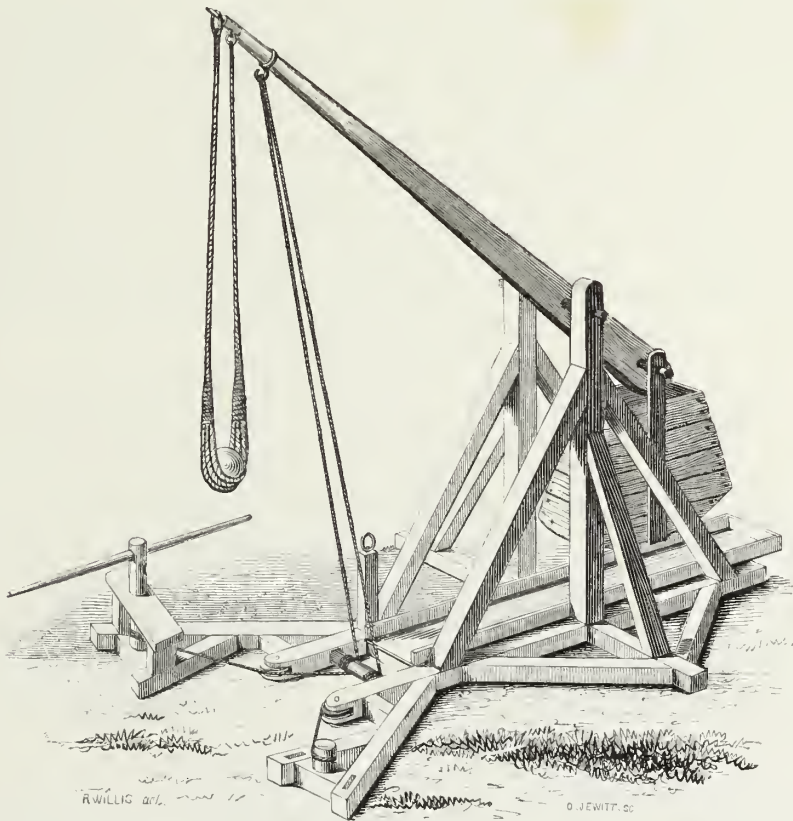


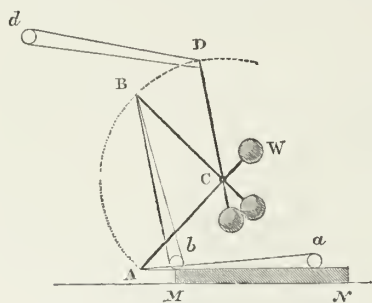
Figure 26.

it is wider below than above, and its bottom curved, in order to accommodate its form to the swinging motion which it must have assumed, and which would have brought the corners of a square-sided chest awkwardly into contact with the

frame or other parts of the engine. Its sides would be best made parallel, as they are usually shewn.

The sling by which the discharge of the missile is effected consists of a long rope, to the middle of which is attached a kind of mat formed of ropes, interwoven with the main rope in such a manner that when the latter is doubled in half, the mat shall constitute a bag capable of embracing and retaining the missile, as the drawing shews. But if the main rope be stretched straight the stone will be released. This sling is suspended by both ends from the long arm of the verge; its inner end is attached to a staple fixed near the extremity of the arm. Its outer end is furnished with a ring, which is merely slipped over a metallic spike that terminates the verge^c.

A shallow trough, open at one extremity, is placed horizontally on the base framing of the engine, between the standards that support the axis of the verge. The action of the machine will be best illustrated by the annexed diagram



(fig. 27), which shews the verge and sling in three positions. C is the axis of the verge, AC its long arm in the lowest position, CW the short arm, with a weight W in this case fixed, as was usual in the smaller trebuchets, instead of being suspended^d.

A *a* is the sling, *a* the projectile, and MN the position of the trough. To discharge the missile the long arm of the verge must be hauled down into this lowest position, so that its small end shall be at about the level of the trough, and in that condition secured by a bolt or latch that will admit of being suddenly released.

The sling must be laid along the trough, the shot placed in its bag, and the ring properly arranged upon the spike. The rope or ropes by which the verge was hauled down being previously unhooked (of which more below), the trigger may be discharged so as to leave the verge at liberty.

The load attached to the shorter end will immediately descend and communicate a rapid rotation to the verge, by which its depressed extremity will be carried

^c The details of the construction and suspension of the sling, as well as the trough, are best shewn in the drawings of Valturius, whence I have copied that portion of my sketch. The trough is also very clearly shewn in fig. 28 below.

^d In one of these engines given by Valturius, the weight is formed of a quantity of stones in a bag tightly bound to the extremity of the verge, so as to form one piece with it instead of swinging from it.

upwards with great velocity. The missile will thus be dragged from one end of the trough to the other. But when the verge has arrived at the position CB , in which the missile b is about to quit the trough, the centrifugal force which tends to carry b away from the centre of rotation C , but has been prevented from so doing by the floor of the trough, will now cause the sling Bb to revolve about B as a centre, and the bag with the missile will fly upwards, its motion being compounded of the rotation of the verge CB round the axis C , and of its own rotation round B . The effect of this second rotation is to increase the angle which the sling makes with the verge, for in the first and second positions the sling is at an acute angle, CBb ; but when it flies out this angle is increased, and in the third position has become obtuse, as at CDd .

The outer end of the sling, as already explained, is merely retained by a ring hanging on the terminating spike. This ring will remain in its place so long as the rope is pulled at an acute angle, and thus draws it inwards towards the shoulder of the spike; it will even remain if the rope be pulled at right angles to the verge, or at an angle a little greater than a right angle; but when the angle exceeds the right angle considerably, the rope, stretched by the centrifugal force, overcomes the friction of the ring on the spike, and pulls it off; the sling immediately flies open, and the missile is free to pursue its onward course through the air.



Fig. 23.—Trebuchet, from a German miniature of the fourteenth century.

The end of the verge must, in the next place, be hauled down to prepare for another discharge. The mode of performing this operation varies in different

examples. In the smaller machines it was apparently drawn down by hand, as in fig. 30 below. In the larger machines the weight was too heavy to be thus raised, notwithstanding the leverage afforded by the length of the opposite arm. A windlass was therefore attached to the frame, usually consisting of a horizontal barrel, with a wheel or handle on its axis, like that for lifting the bucket of a well. The rope, of which one end was hooked to the long arm of the verge, had the other end coiled round the barrel. One or more men by turning the handle or the wheel could thus raise the weight. The wheel shewn in fig. 28 is intended for this purpose; the soldier seems to be occupied in detaching the downhauling rope and arranging the sling.

The next woodcut represents a larger and more complete engine.

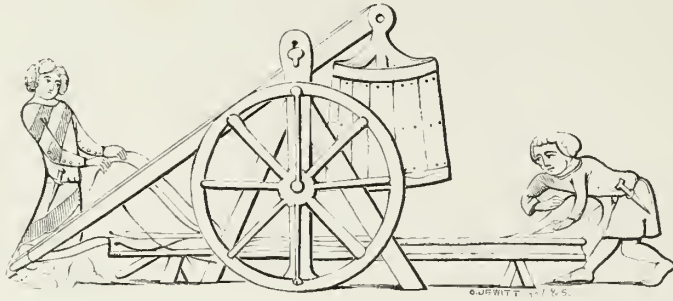


Fig. 29.—Trebuchet, from the MS. of the Romance of Alexander, Bodl. 260. A. D., 1338.

In this, as in the other MS. examples, the verge is in its lowest position. One of the two upright posts for sustaining its axis, with its lateral braces, is distinctly shewn, but is not made sufficiently high to allow the chest to descend to its lowest position. This is manifestly an error of the draughtsman. The trough for the sling is sustained by a pair of short diverging legs near each extremity; various lines representing the sling and downhauling rope are traced, but not very distinctly. The best explanation I can offer is that the double line at the lowest end of the verge is the fixed extremity of the sling, perhaps formed in this instance of a broad leather strap. The soldier stooping down at the right end is placing the stone in its bag; the soldier at the other extremity is holding the free end of the sling, also shewn by a double line, to which the ring should be attached, but is not shewn, and he is preparing to hook it to the end of the verge.

The great wheel belongs to the windlass for downhauling, and the rope for that purpose is indicated by a single line attached to the verge at a point between the two ends of the sling just described, and passing downwards to a point in the

left-hand brace, where it probably turns round a pulley, by which its course is diverted upwards to the barrel of the windlass. A piece of wood under the left end of the trough beyond the pair of legs may be part of the trigger and detent by which the verge is to be held down after the downhauler rope is detached.

The apparatus for hauling down the verge in Honecort's machine is described by him as consisting of two *windas* and a doubled rope in front of the frame.

In England the term *windlass* is applied to the horizontal barrel with levers which is employed on board ship to raise the anchor or other loads ; but in the old French books the equivalent word, *vindas*, is given to the capstan, in which the barrel is vertical, and our windlass with the horizontal barrel is called *treüil* ^e.

Honecort's *windas* may therefore be translated *capstan*, and his drawing clearly shews each end of the doubled rope attached to a circle, which can only be intended for the plan of the vertical barrel of the capstan. The two beams which diverge from the frame on either side, and are connected to it by a short strut, are so placed as to carry the capstans to a sufficient distance from each other to allow the men who walk round the two capstans in the act of pressing against the handspikes to clear each other's paths.

It will be seen, by comparing Honecort's plan with my sketch (p. 197), that his framing permits a pair of capstans to be constructed in such a manner as to connect them firmly with the machine, and yet to enable the men to circulate. In order to shew more clearly the course of the rope, I have omitted the capstan in the foreground, as the construction of both would be exactly the same. The lower part of its barrel only is shewn, and the upper part, together with the two posts and cross-head, must be supposed broken away. The rope is led from each barrel to a horizontal pulley at the end of the long beam, by which its direction is changed horizontally, and brought nearly into parallelism with the beam ; it then is coiled two or more turns round a horizontal transverse roller, and its direction changed into one that admits of being united to the hook of the verge, and of following the angular change of position of that hook during the descent.

^e "Lorsque le tour ou rouleau sur lequel la corde s'entortille est posé de niveau, on l'appelle communément *treüil*. . . Mais lorsque le tour est posé à plomb, comme parlent les ouvriers, ou bien perpendiculaire à l'horizon, on appelle la machine *vindas*."—*Traité de Mécanique, par M. de la Hire*, 1729, p. 138. Vide also Felibien, *Principes de l'Architecture, &c.*, 1690, p. 146 ; Emerson, *Principles of Mechanics*, 4to.

pp. 285, 286. The nautical capstan bears in French the name *cabestan*, and the *vindas* is the mechanist's portable capstan, or *cabestan volant*, which with us was called the flying capstan or crab. The latter name has passed to the more complete machine with toothed wheels and a horizontal barrel that modern machine-makers have substituted for it.—(W.)

Both ends of the rope are carried round the same roller. This serves to govern the simultaneous motion of the two capstans. For if one were turned faster than the other, the rope of the latter would be slackened, and thus, by reducing its tension, enable the men working at the latter capstan to perceive that they were not keeping time with the former. This is a device often employed for this purpose, and it is interesting to have so good a proof of its antiquity.

As the hook of the verge is in its highest position after the discharge is made, it is plain that the downhauler must be replaced on the hook by a long pole with a fork at the end, or by some such contrivance.

The only part of the machine not distinctly shewn is the contrivance for holding down the verge and suddenly releasing it. This varied in different machines. The simplest plan seems to have been a pin stuck in a hole in the framing, which



Fig. 30.—Trebuchet from a French manuscript* of the fourteenth century.

was knocked away by a blow with a mallet, as in Fig. 30; and was probably arranged upon the principle of a carpenter's hook, which will resist an enormous pressure applied parallel to its stem at the extremity of its arm, but is detached by the slightest blow upon the end of its stem^f.

^f In our own language the arrow shot from a cross-bow was in the old time called a *bolt*, and to this day a bolt (of a door) is said to be shot when it is pushed home; *bolt*, and its diminutive *boltel*, or *boutel*, being applied to many cylindrical forms, as, for example, round moldings. Also the word *shaft* is applied to an arrow and to an architectural pillar, and such a pillar is also termed *flèche* and *virga* in English documents of the

thirteenth century; e. g., "1292. Roberto de Corf in partem solutionis pro iij. *flechiis*, iij. *capitibus*, &c., de marmore, &c. . . ."—(*Eleanor Cross Rolls*, by the *Roaxburghe Club*). Vide my *Architectural Nomenclature*, p. 40; and Parker's *Glossary of Architecture*, 5th ed., arts. *Bowtell*, *Shaft*, &c. With this evidence of the common meaning and general application of these terms, there can be no difficulty in ad-

Honecort tells us that this bolt is connected to the small post or stanchion in front of the machine, which is evidently in such a position that the end of the verge when hauled down would be close alongside of it, and ready to receive any simple locking contrivance to hold it down. The piece in the plan with a ring at the ball at the top must be supposed, in the rude perspective of our artist, to be upright, as it appears in my sketch.—(W.)

mitting that the *fleke* of De Honecort is the *bolt* or *detent* of the verge, whatever its exact construction might have been, and is not an arrow. Mr. Lahl, in the *Building News* of Dec. 24, 1858, refers the word *fleke* to the pin that kept the beam from moving, and suggests that our English word *click* is derived from it. The latter name, however, is mani-

festly derived from the peculiar noise which that piece of mechanism makes when in action. M. P. Merimée, from whose review in the *Moniteur Universelle*, Dec. 20, 1858, Mr. Lahl professes to derive his information, supposes the *fleke* to be the *verge*, and decidedly rejects the opinion of Lassus, that an arrow was the missile.—(W.)

z en cele autre page ne poel u' uer les mourees des
 capiteles de le gite de rans par dehors. trel le
 comencement de la cule fin enfi com eiel se.
 dant trel manere douient estre celes
 de canbra; s' loz fait droit. h
 daerrant entaulemēs dou
 faire curiaie.

S'elc le
 droit moue
 de la capes
 de le gite
 de rans s
 toute le man
 iere. enfi com
 eiel sunt p
 deent droit
 en loz estage

S'elc tel vie
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 orbes arches.

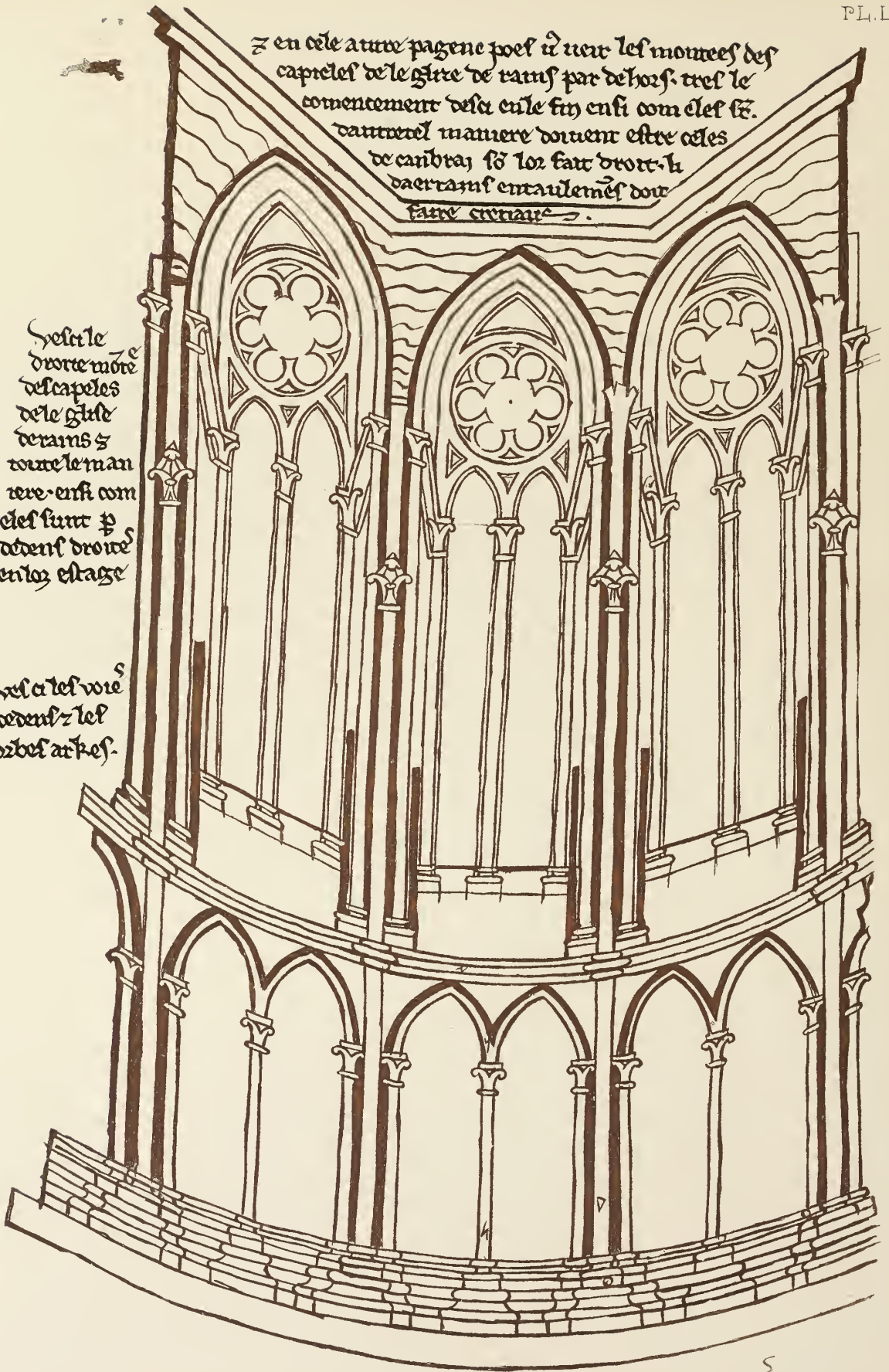


PLATE LIX.

VERSO OF THE THIRTIETH LEAF.

“Vesci le droite montee des capeles de le glisc de Rains et toute le maniere. ensi com eles sunt par dedens droites en los estage.”

“Voici l'élevation des chapelles de l'église de Reims et la façon dont elles sont étagées à l'intérieur.”

“*This is the elevation of the chapels of the church at Rheims, and all their particulars as they are seen within.*”

(The inscription at the head of the drawing belongs to the next page.)

THIS is the first of a series of five pages appropriated to drawings of various parts of the Cathedral of Rheims, which belong either to the apsidal chapels or the nave^f. These, which are perhaps the most interesting of the whole collection, will be better understood by the help of the following sketch of the history of the cathedral.

The documentary history of the building has been preserved by Marlot, who wrote his book first in French, and then made a Latin abridgment of it, which he printed in 1666. The original was for the first time published in 1843, under the title, *Histoire de la ville, cité et université de Reims, par le R. P. Dom Guillaume Marlot*. 4to. From this we learn that the cathedral was burnt in 1210^g, and in the following year the present church was begun. In 1223 Pope Honorius III. by his bull authorised the collection of subscriptions throughout the archbishopric for the works of restoration of the cathedral. Another bull in 1235, of Pope Gregory IX., alleges that the citizens, upon occasion of a quarrel with the archbishop, had carried off the stones prepared for the building of the cathedral to build barricades, and also the tombs of many great personages which

^f The descriptive articles which M. Lassus had appended to these plates are, for the most part, slight and incomplete. Had he been spared, he would doubtless have entered largely into the comparison between the drawings of Wilars de Honcourt and the real building. Indeed, I have reason to know that his original plan included the addition of a set of plates to exhibit those portions of the church which Honcourt has delineated, and to provide thus the same means of testing the accuracy and nature of his drawings which he had supplied for those of Laon, Lausanne, and Cambrai. This part of the commentary having been unfortunately left unfinished, I have been my-

self compelled to undertake the analysis of these drawings, and have consequently given entirely new descriptive essays in illustration of them, in lieu of those in the French edition.—(W.)

^g This date is variously stated as 1212 or 1211, by traditions and different writers. The year 1210, preferred by Marlot, is derived from the *Chronicon Nicasianum*. There is also a tradition that the choir was consecrated in 1215 by the Archbishop Albericus, which is manifestly impossible if applied to the complete edifice, but may refer to the consecration of a single chapel or temporary church for service.—(W.)

had been stored carefully away, and which, having been thus obliterated and destroyed, the memory of many names and good deeds had been lost to history. From these documents, and the testimony of a cotemporary chronicle^h to the fact that the canons of Rheims entered their new choir for service in 1241, Marlot infers that the cathedral could not have been finished before the latter date, and must therefore have occupied more than thirty years in its construction.

This completion is to be understood only of the principal mass of the building, for it appears, from disputes between the collectors of the chapter of Rheims and those of the church of St. Nicaise, that subscriptions for the works of both these churches were carried on even until 1295, when the English wars broke out. And it is recorded in the chapter documents, that the finishing stroke was put to the south tower of the west front next to the archbishop's palace in 1430, at the expense of Cardinal Philastrius; the *jubé* was begun in 1455; and, finally, in 1481 a fire broke out in the cathedral from the negligence of plumbers, and utterly destroyed the roof. These are all the dates and facts relating to the mediæval history of the structure that I have been able to gather from Marlotⁱ.

In the cloister of St. Denis at Rheims there was a monument and effigy with the inscription,—“cy gist Robert de Coucy Maistre de Nôtre Dame et de Saint Nicaise, qui trespasa l'an 1311,” preserved by Marlot^j. This appears to be the only authority for attributing the design of the cathedral to Robert de Coucy, but, as that building was begun exactly a century before his death, it is plain that this architect could not have been the first employed^k.

The few dates above supplied give no information concerning the manner and

^h Marlot, ed. 1843, t. iii. p. 517, ch. 17. This chronicle was in Marlot's possession when he wrote, for in his Latin edition (t. ii. p. 470,) he expressly says, “Adde quod Chronicon Auctoris cœtanei *quod penes me habeo*, refert Canonicos Remenses novum suum chorum ingressos vigiliâ Nativitatis B. Mariæ a. 1241.” It is now lost, with many other documents quoted by him.

ⁱ Gilbert and others supply dates for some of the minor works subsequent to this fire, which do not concern our present purpose. The labyrinth on the pavement of the nave, made in 1240, and destroyed in 1779, had a figure in the centre, which no doubt represented the architect of the cathedral, but the inscription beneath was so trodden out as to be illegible. At the four corners were four other figures of four of the master masons of the work, with the following inscriptions:—(1.) “Jehan le

Loup, qui fut maistre des ouvrages durant seize ans, et qui commença les portails.” (2.) “Gaucher de Reims, maistre des ouvrages durant dix-huit ans qui travailla aux voustes, vousoirs et aux portails.” (3.) “Beruard de Soissons, qui fist cinq voustes et travailla à la grand rose du portail; il fut maistre des ouvrages, durant trente-cinq ans.” (4.) “Jehan d'Orbais, maistre des ouvrages.”—*Gilbert*, p. 26.

^j T. iii. p. 331.

^k This discrepancy was pointed out by M. Gilbert in his history of the cathedral, p. 5; but he, assuming the tradition that Robert de Coucy was the first architect to be a fact, explains the difficulty by supposing that there were two of the same name, father and son, or uncle and nephew. M. Quicherat (p. 5, above) has assigned his death to the year 1241, but I know not upon what authority.—(W.)

order in which the parts of the cathedral were carried on; for this we must have recourse to the building itself. From the exact descriptions given by M. Viollet-le-Duc in his admirable Dictionary of French Architecture, I gather the following summary of the structural history.

The works extending from the choir to the middle of the nave¹ appear to have been continuously carried on to the height of the level of the top of the side aisles. The works above this level exhibit an abrupt change of system, shewn by a more advanced style of ornamentation, and a sudden diminution in the thickness of the walls, producing economy of materials. But, notwithstanding these changes, which indicate a pause in the works and a new architect, the original designs seem to have been respected in this upper story.

Yet, although the lower part was continuously carried on, several differences of style may be detected in it, as might be expected, for it must have occupied, according to M. Viollet-le-Duc, at least eighteen years in its building. The foundations themselves must have cost many years' work, for the original soil is neither level nor firm for from four to eight yards below the surface. The superstructure is also of more than ordinary massiveness. The choir-chapels are circular in plan up to the level of the window-sills, and the entire ground-story of both the transept-gables more ancient than the upper parts of the choir-chapels. For the windows in the transepts have no monials or tracery, and are bordered with rich moldings and ornaments in the early French style. But the chapel windows, on the contrary, have early tracery, the same as that of Amiens, (c. 1230); and, to accommodate this tracery, the plan of the chapels is abruptly changed from circular to polygonal at the level of the sills, it being impossible, as M. Viollet-le-Duc has pointed out, to construct tracery on a circular plan^m.

He states that the ornamentation of all the lower parts above defined, up to and including the cornice of the radiating chapels, denotes the work of an artist who belonged to the school which arose at the end of the twelfth century. Above this level, including the clerestory with the pinnacles and flying buttresses, the ornamentation possesses all the distinctive characteristics of the middle of the thirteenth century. The whole of the four western severeys of the nave from the ground must also have been included in this second portion of the works, the style of which shews that it could scarcely have been commenced before 1240ⁿ,

¹ Or, more exactly, exclusive of the four western compartments of the nave.

^m This transitional combination also occurs at Tours. *Dict. d'Arch. Franç.*, t. ii. p. 470.

ⁿ *Dict. d'Arch. Franç.*, t. ii. pp. 320, 321:—"Ce ne fut guère qu'en 1240 que l'on continua les parties supérieures du chœur, que l'on commença les premières travées de la nef et la façade." It must be remembered

according to M. Viollet-le-Duc. Yet, as there seems no reason to doubt that the canons entered the choir in 1241, I would rather place the second period a few years earlier, for the clerestory of the choir must have been finished and roofed in, although not vaulted over the centre, at the latter date, and this agrees with the state of the works, as shewn by Honecort's drawings described below. For M. Quicherat's ingenious biography has placed the visit of our artist to Rheims about 1244, when he received his orders to go to Hungary^o.

Comparing the documentary and structural histories, I conclude that the building, commenced by the original architect in 1211, was carried on by himself and his successors until, in 1241, it had arrived at such a state as to admit of its being employed for service, the eastern portion of the choir being at that time covered in, but not vaulted over. The remainder of the work, namely, the pinnacles from the side-aisle walls upwards, with the flying buttresses and the central vaults, the clerestory of part of the nave and transepts, and the entire building of the four western compartments, with the great west front, towers, and transept gables, being, as usual, carried on piecemeal as funds could be collected, lingered for two centuries. The diminution of dimensions and setting back of the pinnacle-shafts, which is so clearly described by M. Viollet-le-Duc^p, appears to me to have been the natural effect of the increased knowledge and advanced taste of the later architects, who lived at a period when experience had shewn how to build with greater lightness, as well of material as of appearance. I would rather suppose this, than that it was the mere result of want of funds, which compelled the builders to economise materials.

We may now proceed to the examination of Plate 59, which is a drawing of the interior of one of the radiating chapels of the choir. Its present state is beautifully exhibited by M. Viollet-le-Duc's sketch, placed opposite to it.

Recollecting the fact, that in the thirteenth century no rules or principles for perspective representation had been discovered, it is really surprising to trace the fidelity of this drawing by comparing it with the leading points of the existing building, which I shall proceed to enumerate for that purpose.

that although a skilful architect can derive the order in which the parts of a building were erected and the changes they have undergone from an examination of the structure alone, and even the time probably consumed in the work, and can also shew the cotemporary buildings, yet the actual years in which the work was carried on must be derived from written documents, which unfortunately are exceedingly rare,

and generally difficult to identify with the especial part of the building to which they allude. The dates given in the above dictionary are very often conjecturally assigned from style alone, by the author's confession in the note at p. 292, t. ii.—(W.)

^o P. 6, and pl. 19 above.

^p *Dict.*, vol. ii. p. 317. See pp. 224, 225, below.

The walls beneath the window-sills are on a circular plan, and decorated with blank arcades of two arches to each severcy. Above the string-molding, or tablement, which surmounts the arcade, the plan of the walls is changed into a polygonal form, as already mentioned. The string-molding over the arcade is the edge of a level surface, which forms a gallery or passage in front of the sill walls of the windows; for the continuity of which, openings are pierced through the projecting piers. These openings are indicated in the drawing by a thick black vertical stripe.

The inscription, "Vesci les voies dedens et les orbes arkes," "Here is the interior passage and the blank arches," refers to the gallery, and to the arcade below; for I have elsewhere shewn^a that the term *orb* was applied in the middle ages to blank or blind arches and panels. It is derived from the Latin *orbis*. The windows are of the primitive form of two pointed lights, upon the arch-heads of which a circle rests. The jambs and the central monial have each a shaft, from the capital of which the arch-head springs without stiling, the arch itself being nearly of the form termed equilateral. The arch-head of the whole window springs high above the lights at the level of the centre of the circle. The circle has six cusps, of which two are placed on the vertical diameter.

A vaulting-shaft rises from the pavement in front of the orbate arcade, and is continued on the narrow face of the pier which separates the windows. Its capital lies below the level of the capitals of the window-shafts, and bears a vault-rib. From the pavement of the gallery upwards this vault-shaft is flanked on each side by a small shaft corresponding to the window-shafts, and having its capital on their level, and consequently above that of the vaulting-shaft; these bear the wall-ribs, and each of their capitals is connected with that of the corresponding window-shaft by a horizontal prolongation of the neck and abacus molding and of the foliage. The base-moldings of the window-shafts, however, lie rather higher than those of the wall-rib shafts, being placed on the sill-wall.

Every one of the particulars above enumerated are shewn in the sketch of Wilars de Honcourt^r, although obscured by his imperfect mode of drawing. Even the general proportions are not very different from the truth. In criticising

^a Architectural Nomenclature of the Middle Ages, p. 53; and Parker's Glossary, 5th ed. art. Orb. M. Lassus, unaware of this use of the word orb, and supposing it to refer to the circular plan of the passage, has translated the above memorandum, "Voici les couloirs intérieurs et les arches

du pourtoir," p. 207.

^r The chapels are delineated in Gailhabaud's *Architecture*, and in M. Viollet-le-Duc's *Dictionary*, t. ii. p. 472,—from which copies of the two woodcuts of the exterior and interior have been obligingly supplied by the publishers.

Honecort's ingenious struggle to represent the horizontal bands which connect the window-shafts with their corresponding wall-rib shafts, it must be remarked that the piers between the windows are slightly wedge-shaped in plan, with the narrow end inwards; so, in reality, two sides of each pier might just be seen at once by a person standing on the centre of the polygon.

The differences between Wilars' sketch and the real building are in detail. The vault appears not to have been made at the time of his visit: he has shewn the lower portion only, or springing-stones, which are always built at the same time as the wall. The upper extremity appears as if three ribs were intended to spring, but as this is impossible, from the plan of the chapel, it is probably only an attempt to represent the spreading outwards of the springing at the top. The bases of the shafts are too large, and the complex base which rises from the pavement is altogether different in distribution and proportion from the present one, although it has the same number of members.

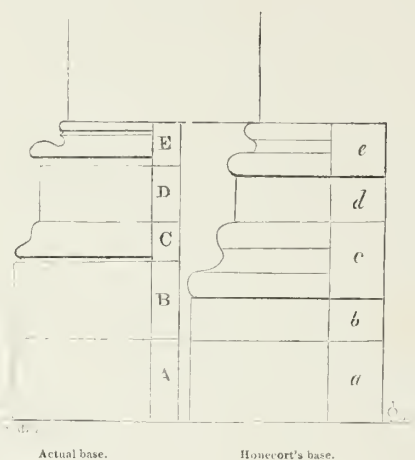


Fig. 32.

In this woodcut the profile of the actual base and Honecort's representation of it are placed side by side. Although at first sight they appear altogether different, I believe that the difference is solely produced by the coarseness of the drawing.

Reckoning downwards, we have in both, first a base-mold, E, *e*, with its plinth, D, *d*. Beneath these are a second base-mold, C, *c*, with a plinth, B, *b*, resting on a sub-plinth, A, *a*. Honecort has given too much space to his base-molds, at the expense of his plinths, and has drawn the profiles very roughly, but yet not so as to make it impossible that they were intended to represent the existing ones. The molding *c* is an undulated one, and the intermediate parallel lines were not required. But as the mediæval base-mold of the thirteenth century is made up of

one concave between two convex forms, we may suppose that Honecort's rule for sketching it would naturally be to draw four parallel guide lines at the proportional distance corresponding to the widths of the three members, and then to mark the profile across them.

Honecort's mode of distributing the base is quite contrary not only to that of the chapels in question, but to the ordinary practice of his time. The compound base is employed for the great vaulting-shafts of the interior, and also for the smaller shafts of the arcade beneath the windows. Every member of it is therefore carried horizontally round the whole interior. But Honecort has made the whole pile of moldings (with the exception of the sub-plinth A) mitre about every separate shaft.

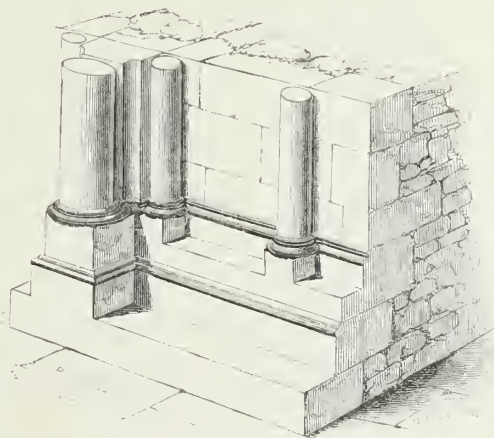


Fig. 33.—Base-mold of the chapels at Rheims.

The above sketch shews the real distribution. It represents a fragment of the lower part of the wall, including one of the compound piers in front of which the vaulting-shaft is placed, and on each side of it one of the small shafts of the arcade: the single arcade-shaft, which stands in the middle of each compartment, is also seen. It will be perceived that the upper base-mold, E, and the upper half of its plinth, D, do really mitre round each shaft and run along the wall, in the way shewn by Honecort. The lower half of D, and the second basemold and plinth, C, B, only mitre round the vaulting-shaft and run straight from that to the next, thus affording a stylobate for the arcade and giving distinctness to the vaulting-shaft. The sub-plinth, A, is carried without break beneath the whole. This is in truth the universal principle upon which base-molds are arranged, the lower members presenting fewer breaks than the upper ones. As Honecort's mode of representing the breaks consists simply in drawing the profiles across a series of parallel lines

previously drawn, without any attempt to shew the returns in perspective, we may suppose that he had forgotten the real arrangement when he introduced these profiles into his drawing. Such a basement as he has represented is very unlikely to have been ever actually executed^s.

This interior view, compared with the corresponding exterior in the following plate, curiously illustrates the conventional methods of representation, and the difficulties they involved, before the true theories of projection and perspective were worked out. All the horizontal concave lines of the interior are drawn concave upwards on the paper, as if the artist began his drawing from the top. They become less and less concave as they descend, but never horizontal, so that if the artist had stationed himself in a pit, with his head below the level of the pavement, this part of his perspective would have been true. In the exterior, on the contrary, all the horizontal convexities are drawn convex upwards, but more so at the bottom than at the top, which is not true on any supposition^t. The lateral windows with their tracery, standing obliquely to the spectator, exhibit a strange confusion of lines. The circle is a true one, instead of an ellipse, as it should be; the arch-heads above are inclined to right and left, away from the middle of the drawing in the interior, and towards it in the exterior view; the light-heads below awkwardly distorted to fill the space between the circle and the inclined range of capitals; and, lastly, the sides of the jambs in the interior are both of them seen in perspective, as if the spectator were opposite to each window in turn, or rather as if he stood on that point of the pavement which is the centre of the polygonal plan of the apse.—(W.)

^s M. Lassus supposes that the base has been altered, but I have endeavoured to shew that the drawing is in fault. He also is of opinion that Wilars has omitted the vault-ribs because they would have concealed the

tracery of the windows in his sketch.

^t It would be true for a representation of a concave, or interior, supposing the artist's eyes to be above the top of the paper.



ARSIDAL CHAPEL OF RHEIMS CATHEDRAL.

FIG. 34 — EXTERIOR VIEW

From the Dictionnaire de l'Architecture Française, par M. Viollet-le-Duc, t. II, p. 473.

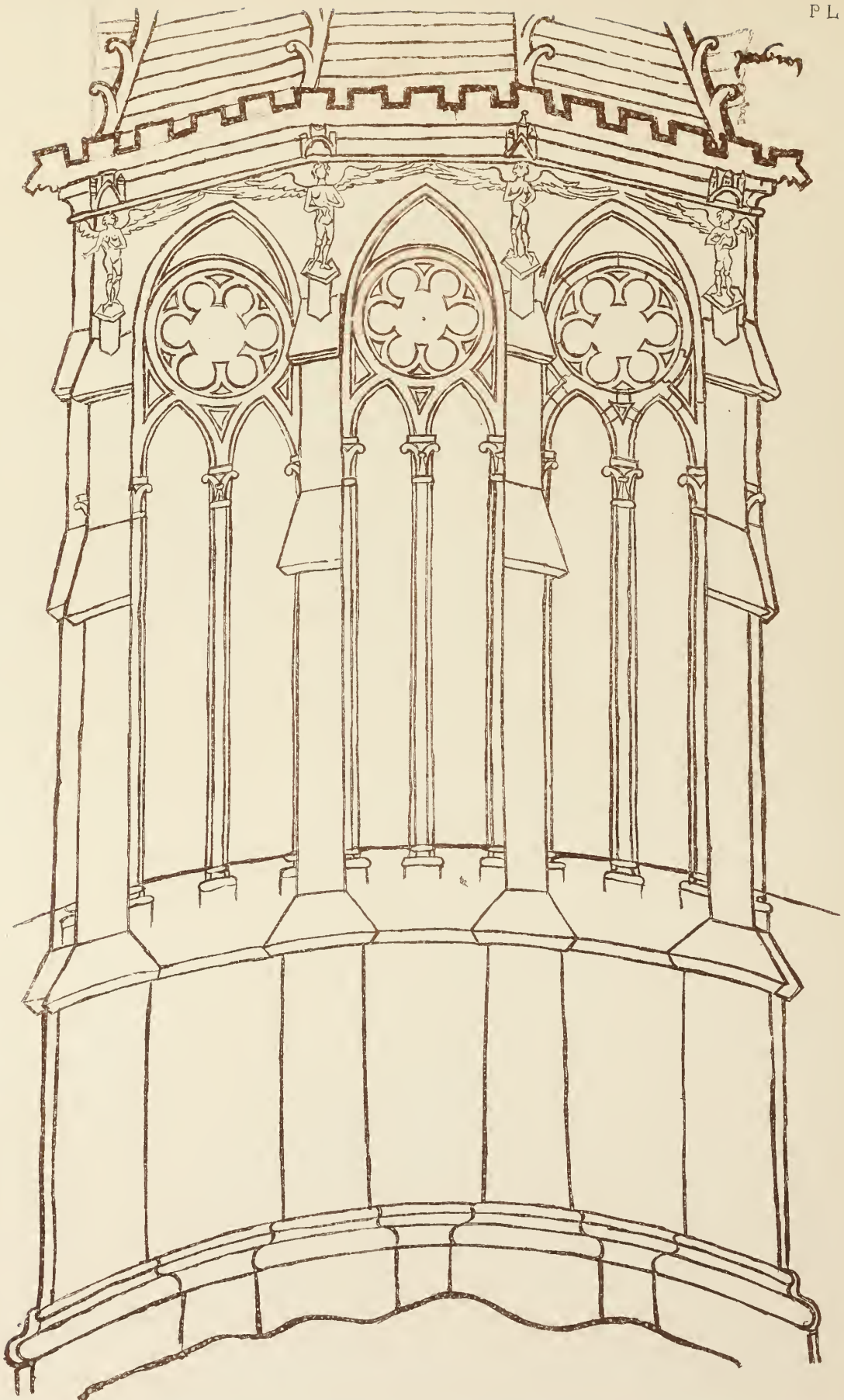


PLATE LX.

RECTO OF THE THIRTY-FIRST LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE NUMERAL XVIII.

“ Et en cele autre page ne vus veir les montees des capieles de le glise de Rains par de hors. tres le comencement descil en le fin ensi com eles sunt. dautretel maniere doivent estre celes de Canbrai son lor fait droit. li daerrains entaulemens doit faire cretiaus.”

“ En cette autre page vous pouvez voir les élévations extérieures des chapelles de l'église de Reims, ainsi qu'elles sont depuis la base jusqu'au sommet. De cette manière doivent être celles de Cambrai si on les construit. Le dernier entablement doit former des créteaux.”

“ In the next page you may see the elevations of the chapels of the Church of Rheims on the outside, from the beginning to the end, just as they are. In the same manner will be those of Cambrai if they are rightly made. The upper tablement (or entablature) must have merlons.”

By comparing this exterior view with M. Viollet-le-Duc's accurate sketch of the chapel, it will be seen that the principal features are delineated with tolerable fidelity. It shews the circular form below the window-sills and the polygonal above. In the reality, a huge buttress for the support of the flying buttresses of the clerestory is introduced between each apsidal chapel, and this buttress is omitted by our artist on both sides of his drawing. Had he not inserted the base and capital of a lateral window-shaft beyond each of his outer buttresses, the double outline of the latter might very well have been intended to shew the face of the great buttress, so that it is probable that the facings of the great buttresses were not completed at the time of his visit, and that he finished them subsequently in his sketch in imitation of the others[†]. In the tracery of the window the circle is truly represented as having its bowtell molding completely detached from that which circumscribes the arch-head of the window, but mitred with those of the light-heads. He has also marked the joints of the masonry in the tracery of one of these windows. The angels with outspread wings still stand on the pentagonal abacus of a short pentagonal pedestal, as in the drawing, and over their heads is an insignificant canopy, not very different from that represented[‡]. But these angels are clothed in a long robe, of which

[†] Vide Plate 63 and its explanation.

[‡] These little canopies are variously arranged in

the different chapels. The lower stage of the buttresses below the windows is proportionally too high,

Wilars has completely denuded them, and has made their wings much too long. He has also omitted the hoodmold of the windows with its flower knobs, and the carved flowers in the casement-molding of the tablement which tops the wall, and is itself crowned with a battlement of *cretiaus* or merlons ^v, as Wilars has carefully directed. In providing similar members for the walls of the nave and side-aisle, (in Plates 61 and 62,) he says, "There must be merlons on the tablement to provide a passage round about it in case of fire." M. Lassus states that this contrivance still remains on the apsidal chapels and transepts, but is surmounted by a high stone balustrade, erected when the works were resumed about 1240 ^x. A leaden gutter conceals the original finish of the walls of the older compartments of the nave. He explains that the merlons were flat on the top, so as to furnish stepping-stones along the wall, and especially in front of the buttresses, while the intermediate embrasures of the battlement were sloped downwards, so as to throw off the water. To do this more completely, the hinder part of the merlon was rounded off, as the annexed plan (fig. 36) shews. By comparing it with the accompanying section, (fig. 35,) the arrangement will be completely understood ^v.

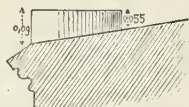


Fig. 35.—Section at A B.

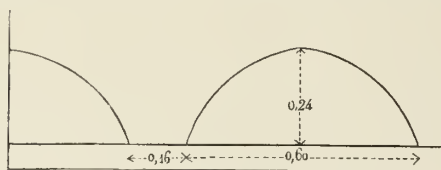


Fig. 36.—Plan of the original battlement of Rheims.

Wilars' drawing represents the chapel with a high-pitched pyramidal roof, the angles of which are garnished with a crest of crockets. They are at present roofed with low isolated pyramids, covered with lead and concealed by the high balustrade.—(W.)

and the base-mold very coarsely drawn, the interval between the projecting plinths being less than their width, instead of being one-half greater. I presume the molding which caps the plinth to vary in different chapels, for Gailhabaud's artist draws it in the same form as Wilars, and M. Viollet-le-Duc substitutes a double chamfer in the annexed view.

^v The rising parts of battlements are in English termed *merlons*, and the intermediate spaces *embrasures*.

^x It is well shewn in the plan of an apsidal chapel with part of the transept, in Gailhabaud.

^v This construction of the merlons of Rheims is described by M. Lassus as above, and also by M. Viollet-le-Duc in his Dictionary, t. ii. p. 317, where he inadvertently states that "Villart de Honnecourt terms them *carniaux*." In t. iv. p. 33, art. *Corniche*, he gives them their proper name of *cretiaus*, referring to the French edition of the Album which had just appeared.

PLATE LXI.

VERSO OF THE THIRTY-FIRST LEAF.

THE legend which properly belongs to this page is written at the bottom of the page which faces it in the manuscript, and is the recto of the thirty-second leaf. But for the better illustration of the drawings I shall place it here, together with the lateral inscription on the margin of the present page, which is also partly written on the opposite one.

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“Vesei les montees de le glise de Rains et del plain pen. dedens et dehors. Li premiers entaulemens des acaintes doit faire cretiaus si quil puist avoir voie devant le covertie. encontre ce covertie sunt les voies dedens. Et quant ces voies sunt volses et entaulees. adont revienent les voies dehors con pnet aler devant les sucls des verieres. En lentaulement daerrain<sup>z</sup> doit avoir cretiaus con puist aler devant le covertic. Ves aluec les manieres de totes les montees.”

“Entendez bien a ces montees. devaunt le covertiz des acaintes doit aver voie. sur lentaulement. et de sur le combe des acaintes redoit aver voie. devant les verreres et un bas creteus si eume vos veez. en le purtraiture devant vos. et sur le mors de vos piliers doit aver angeles. et devant ars buteret. Par devant le grant comble en haut redoit aver voies. et creteus desur lentaulement ken i puit aler pur peril de fiu. et en lentaulement ait des nokeres por leve getir.—pur les capeles le vos di.”

“Voici les élévations de l'église de Reims et des murailles en dedans et en dehors. Le premier entablement des bas côtés doit faire créteaux, afin qu'il puisse exister une voie devant la couverture. Au niveau de cette couverture sont les galeries intérieures. Quand ces galeries sont voûtées et entablées, on retrouve la galerie extérieure qui permet de circuler devant le seuil des verrières. Le dernier entablement doit être à créneaux pour que l'on puisse aller devant la couverture. Voyez là la façon de toutes les élévations.”

“Remarquez bien ces élévations. Devant la couverture des bas côtés il doit y avoir une voie sur l'entablement, et il doit y en avoir une nouvelle sur le comble de ces bas côtés devant les verrières, avec des créteaux bas, comme vous le voyez en l'image devant vous. A l'amortissement de vos contre-forts il doit y avoir des anges et par devant des arcs-boutants. Devant le grand comble du haut il doit y avoir des voies et des créteaux sur l'entablement, pour circuler lorsqu'il y a danger du feu. Il doit y avoir aussi sur l'entablement des chéneaux pour déverser l'eau. Je vous le dis encore pour les chapelles.”

<sup>z</sup> DAARRAIN, Dernier, qui est après tous les autres.—(*Roquefort.*)

*“ These are the elevations of the Church of Rheims, and of the flat (aisle) wall within and without. The first tablement of the side aisles must have merlons, so that there may be a gangway in front of the roof. Over against this roof are the inner passages (or triforium gallery). And above the vault and tablement of these passages we find the outer gangway in front of the window sills. The upper tablement must have merlons, so that there may be a passage in front of the roof. Behold the fashion of all the elevations.”*

*“ Consider these elevations carefully. In front of the roof of the side aisles there must be a gangway on the tablement, and on the top of the roof of the side aisles another in front of the windows, with low merlons, as you see them in the picture before you. On the caps (mors<sup>a</sup>) of the pilasters (piliers) must be angels, and in front flying buttresses (ars boteret). In front of the great roof above there must be gangways and merlons on the entablature to provide a passage in case of fire, also gutters or spouts (nokeres) to throw off the water.—I say the same for the chapels<sup>b</sup>.”*

THIS pair of elevations represent one severey, externally and internally, of the nave, or choir, of Rheims, and are extremely interesting for the evidence of the antiquity of the similar method so commonly followed by ourselves in representing such buildings.

They shew also the extreme carelessness or neglect of true proportion in the delineation of architecture in this volume. For although the two drawings shew two sides of the same wall, the outer view is five and a-half times higher than the breadth of the severey, and the inner view seven times higher than its breadth. The former is in fact correct, the latter consequently much too narrow.

The width of the piers, which in reality is half the distance between them, is shewn rather too small; the height of the triforium compartment greatly exaggerated from one-seventh to little more than one-fifth of the total height of the severey.

Notwithstanding this, the width of the severey is so much contracted, that the windows remain far too narrow, and the sill-wall of the side-aisle too high. The latter is ornamented with an arcade, of which no traces are to be found in the real building. The pier-arches are most incorrectly drawn in the simple equilateral form, and consequently ridiculously disproportionate to the piers upon which they rest, which are made four times as high as the arches.

The real pier-arches are actually of the equilateral form, but they are stilted so as to raise their springing line so high above the abacus as to make the total decorative height of the arch about half that of the pier, which is a very agreeable proportion<sup>c</sup>.

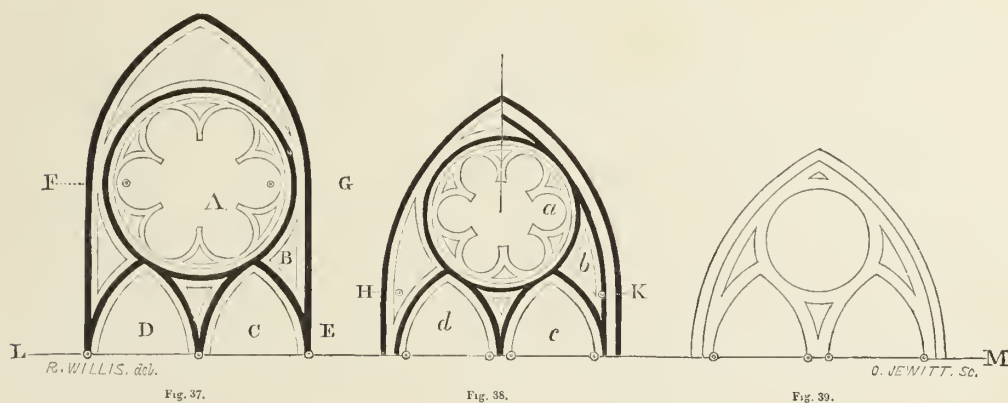
<sup>a</sup> *mors*, the sloping cap of a buttress which, in the English phrase, *dies* against the wall.

<sup>b</sup> This latter remark is written on the side of the opposite page in continuation of the inscription.

<sup>c</sup> The word pier here includes the capital and base. I have derived these measures from the engravings of Gailhabaud.

The central shaft of the triforial arcade is represented of greater diameter than the lateral ones. In Gailhabaud's elevation the same peculiarity is shewn, but in a much smaller degree. The vaults of the interior were evidently not built when the drawing was made. This also appears from Plate 63.

The indifference of the draughtsman to the real proportions of the parts of the edifice is the most strikingly shewn by the tracery of the windows. Side by side we see the inside and the outside of the same clerestory window and of the same side-aisle window. The scale of heights in the two elevations is evidently the same. Yet the arch-heads of the window and of the lights are all drawn of the equilateral form, although the narrower proportion of the horizontal scale of the interior produces the most glaring discrepancy between the artistic effect of the two representations of the same object. I shall proceed to shew that these representations are both of them unlike the original in two essential respects.



These three diagrams exhibit the proportions of three specimens of that early tracery pattern which simply consists of a circle or hoop over two arches. Fig. 37 is the primitive form, which was employed at Amiens, in the chapels of Rheims, and in several other French cathedrals, about the year 1230.

The thick black line is the bowtell or roll molding, which is the most prominent member of the tracery, and the fine lines which run parallel to its course on either side shew the forms of the glazed openings. The hoop alone is ornamented with six cusps. In this early tracery the hoop rests upon the arch-heads below, so that their respective roll-moldings unite and are mitred together. But its bowtell stands completely free from that of the outer arch of the window-head, which encloses the whole tracery. The lateral moldings of the hoop just touch those of the outer arch for the sake of obtaining mechanical

support, but the decorative effect is that of a hoop simply resting on the light-heads. In the earliest remaining specimen at Amiens, which is at the south-eastern extremity of the nave, a little crocket projects from the jamb-mold of compartment B (fig. 37) to touch and support the hoop, which is more completely free from the jambs than at Rheims. In the tracery of Salisbury cloister and chapter-house (c. 1256) the same detachment of the hoop is to be found, but the moldings are much richer and more multiplied than in the French specimens. The idea of a hoop resting on two arches is also distinctly exhibited in several of the earlier portions of Salisbury Cathedral<sup>c</sup>.

When the tracery principle was fully developed, the hoop was mitred to the outer arch-molds, in the same way as to the small arches below. The Sainte Chapelle at Paris, begun 1242, and finished in 1247, is a complete example of this. In fig. 38 the two methods are shewn, namely, the primitive detachment of the hoop on the left-hand side of the drawing, and the arrangement in which it is united to the roll-molding of the lateral arch on the right-hand side. These two methods are seen together in the same window in the clerestory of the nave and choir at Amiens<sup>d</sup>. But at Rheims the older method is retained in all the lateral windows of the choir and nave, exactly as shewn on the left-hand side of fig. 38; and probably out of respect to the original designs. Fig. 39 is the representation of the lateral windows of the nave at Rheims, as given by De Honecort in the plate we are now examining, and also in the sketch he made in 1244 (Pl. 19), when he received orders to go to Hungary. In this drawing the hoop mitres completely with the lateral arch-molds, agreeably to the later practice introduced into the Sainte Chapelle and other cotemporary works, but by no means in accordance with the example he had before his eyes, as shewn on the left-hand side of fig. 38. Yet the characteristic which I have pointed out is one that must have been known and observed by a professional architect. In his interior view of the chapel windows (Pl. 59) he has committed

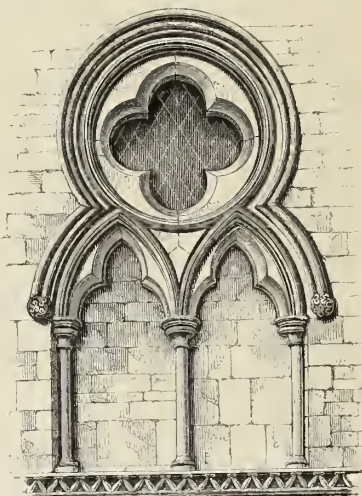


Fig. 40.—Eastern gable, Salisbury Cathedral.

<sup>c</sup> Oxford Glossary, Plates 231, 237.

<sup>d</sup> These windows are of four lights, and of two orders of tracery. The first is the hoop on two arches, and its hoop is mitred with the arch-mold. The two arches are filled with a second order of tracery, on

the same pattern, but having the hoop detached. A similar example is the chapel of St. Germain en Laye, c. 1240, as appears from the engraving in Viollet-le-Duc's Dictionary, t. ii. p. 433.



the same mistake, yet in his exterior view he has drawn the tracery with the hoop detached in the most exact accordance with the truth.

But there is a point of the same kind which must be next examined in relation to the proportions of the arches of the tracery. In the chapel windows of Rheims, (fig. 37,) the arch of the window-head springs from the level F G of the diameter of the hoop, and therefore greatly above the impost of the small arches D, C, which form the heads of the lights. Thus a very large hoop is obtained. In the lateral windows of the nave, fig. 38, the impost line, H K, of the window-head is still considerably above that of the light-heads. But Wilars de Honcourt, although he has drawn the chapel-windows in Plates 59 and 60 with perfect correctness in this respect, has in his representations of the nave-windows made the window-head spring from the same level as the light-heads, and has described its arch from the same centre points as the latter. The small circles in these figures are the places of the centre points, and in fig. 39 it will be seen that the inner arches of the light-heads and the inner line of the window-head are all equilateral. Here, again, our artist has given the arrangement of the tracery of the "Sainte Chapelle," and not that of Rheims.

Its effect is to make the hoop, as well as the lateral spaces *b*, much smaller, and to reduce the proportional height of the tracery. It thus alters the physiognomy of the window in a manner that would scarcely have escaped the eye of a practical architect. These remarks shew that our artist drew details in accordance with the newer habits of his own time, unless the older forms were so fully developed, as in the chapel windows, that he was perforce compelled to study the exact relation of their parts. The proportions which he has given to the tracery of the nave-windows are those which were generally adopted in England.

This pair of sketches of the interior and exterior compartment could not have been made from the working drawings instead of the real building, for they shew the structure in a consistently incomplete state in several places, exactly as it would naturally have been seen while in progress, but as it would never have been represented in designs. Thus, the vault in the interior is not yet built, and we see the lower or solid portion of the vault-ribs carried up, but stopping short of the abacus of the window-shaft and wall-rib, or *formeret*, in an unfinished manner, with the rough wall above. On the exterior, the flying buttresses and the pinnacles of the side-aisle buttresses, not being required until the great vault was in progress, are also not built, but the first course of the pinnacle is set upon the parapet, and the commencement of the narrow opening by which the water was to be conveyed from the roof is shewn, with the bases of its lateral shafts.

In the clerestory walls the capitals of the shafts which were to support the flying buttresses are seen, they of course being built corbel-wise into the thickness of the wall, but the shafts themselves, being of superficial masonry, are not yet erected. Statues of angels are indicated on the top, with outspread wings, like those of the apsidal chapels. But they are shewn in diagram lines only, as hieroglyphics to shew that statues were intended, but not yet set up.

The battlement of the side-aisles with its stepping-stones is mitred round the buttresses, to afford a passage in front of the great pinnacle shafts. But in the existing building the arrangement is different; for when the pinnacle shafts were built, they were made smaller than in the original design, and were narrowed and set inwards to such an extent as to leave a free passage round their outer faces at the level of the parapet. The stumps of the original pinnacles shewn in the drawing were of course taken down, as well as the embattled parapet below, when the present pinnacles were carried up after the visit of Wilars de Honecort.

It is necessary to state that the view taken of this subject by M. Lassus varies materially from that which I have endeavoured to develop. His entire commentary upon the plate in question runs thus:—"This drawing differs in so many respects from the real building, that we can only conclude that it must have been traced, before the resumption of the works in 1241, from plans that were never executed. On the exterior, besides the merlons of the side-aisle walls, whose existence the modern leaden covering prevents us from verifying, Wilars indicates a similar crest under the clerestory windows. Of this there is now no trace, and it would have been useless as stepping-stones, because the passage itself is carried through openings in the pilaster buttresses of the clerestory wall. Honecort's drawing shews this passage, but suppresses the flying buttresses and upper termination of the side-aisle buttresses, to shew the form of the pilaster buttresses of the clerestory wall. On the caps of these buttresses, which Honecort calls *piliers*, he has indicated—in the drawing and in its legend—angels, where in the real building are placed human figures, like cariatides, supporting the piers of the high parapet above. Yet the inscription gives in this place a gutter and merlons to furnish a passage in case of fire, consequently no high parapet. Were the figures which Wilars took for angels a mere ornament? or were they intended to support gurgoyles, the *nokers* which were to throw off the water from the high roof to that of the side aisles? Although the present high balustraded parapet is manifestly a work of the fifteenth century, yet as the traces of a different balustrade may be detected upon the towers, which belong to the end of the twelfth century, it may be granted that a similar one was destined for

the clerestory of the nave by its architect. It follows, therefore, that subsequently to the visit of the architect of Cambray to Rheims, the plans of the latter church were changed in several respects. One of these changes is evident in the pinnacles that rise above the side-aisle wall. They are set back so far as to leave a free passage round their outer faces, so as to render useless the merlons which still remain on the oldest part of the nave, but which would have been necessary had the pinnacles been carried up on the original scale of magnitude. We may direct attention to the earnest and repeated importance which Honecort attaches to the means of access and circulation round about every story of the edifice, mainly to guard against fire, like that fatal one which had, at the beginning of the century, destroyed the very cathedral which he was studying.

“The principal difference which we remark in the interior elevation is certainly an important one: it consists in the arcade shewn below the side-aisle windows, of which not the slightest trace can be found either in the nave or transepts, although it exists in the apsidal chapels.”—(L.)

It will be seen that M. Lassus accounts for the differences between Wilars' drawing and the existing building by supposing that the artist drew from plans which were never executed, while, on the contrary, I have endeavoured to shew that some of these differences are the result of his imperfect mode of drawing, and that others relate to mere parapets and stumps of pinnacles, which were naturally removed or obliterated when the works were carried on after Honecort's visit.

The setting of the mass of the pinnacles inwards, attributed by M. Viollet-le-Duc to economy of materials and want of funds, appears to me to have been dictated by an increased acquaintance with the action of the diagonal thrusts of the flying buttresses, which are better resisted by placing the centre of gravity of the outer buttress and pinnacle at a greater distance from the front face of the lower stages of the side-aisle buttresses. In English examples I have met with similar cases of re-erecting the pinnacle shafts in a more inward position, of which there is a very striking example on the south side of the choir at Ely.—(W.)



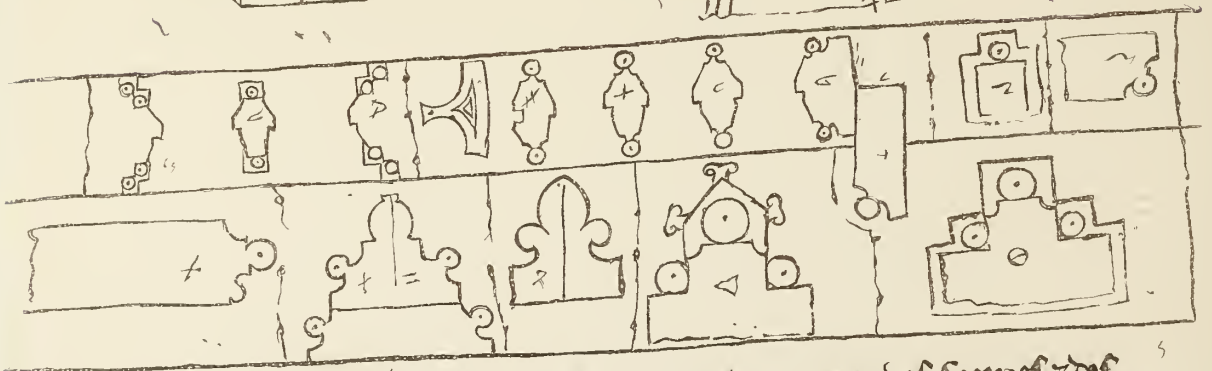
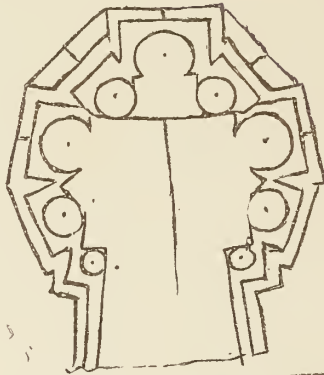
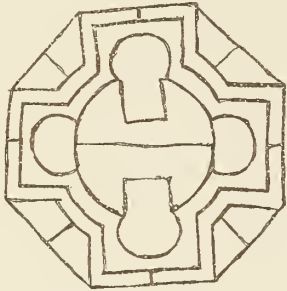
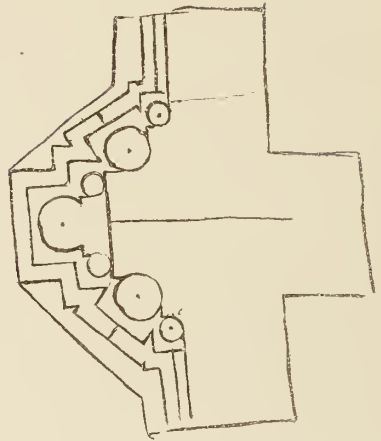
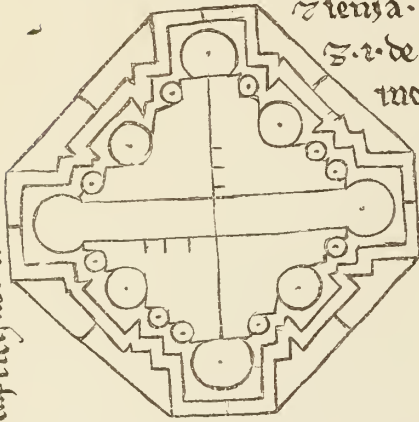


Si poot il uer l'un des pilerz torauf de le  
 Gra de rains. S. i. de ceuf dentre. ii. capieles.

z sena. i. del plainpen.

S. i. de ceuf de le nef del  
 mouster. par tol cel  
 pilerz sunt les  
 lozons teles com  
 eles i douet estre.

le  
 pur les capieles, uol di.



Desci le moitie des chapieles de cele pague la deuant. des formes z des  
 uerieres. des ogues z des doubhaus. z des lozons p de seure.

Desci les montees de leglise de raul z del plain pen. dedens z de hors.  
 La premier estaulement des acantes doit faire cretaul si ql puit  
 auoir uoie deuant le couertic. encontre ce coutric sunt les uoies dedens.  
 z quant ces uoies sunt uolles z entaulees. dont reuenent les uoies de hors  
 es puer aler deuant les suels des uerieres. en l'entaulement daerrai doit auoir  
 cretaul con puit aler deuant le couertic. Des aleez les manieres de totel les  
 montees.

## PLATE LXII.

RECTO OF THE THIRTY-SECOND LEAF, MARKED IN THE FIFTEENTH CENTURY WITH  
THE NUMERAL XVIIIII.

“Ci poes vus veir lun des pilers toraus de le glise de Rains. et .i. de ceus dentre .ij. capieles. et sen i a .i. del plain pen. et .i. de ceus de le nef del moustier. par tos ces pilers sunt les loizons teles com eles doivent estre.”

“Ici vous pouvez voir l'un des piliers de la tour de l'église de Reims, et l'un de ceux d'entre deux chapelles, et il y en a un des murs de clôture et l'un de ceux de la nef de l'église. Les liaisons de tous ces piliers sont telles qu'elles doivent être.”

“Here you see one of the great piers<sup>o</sup> of the church of Rheims, and one of those which are between every two chapels; and there is one from the plain wall, and one from the nave of the church. In all these piers the bond is as it must be.”

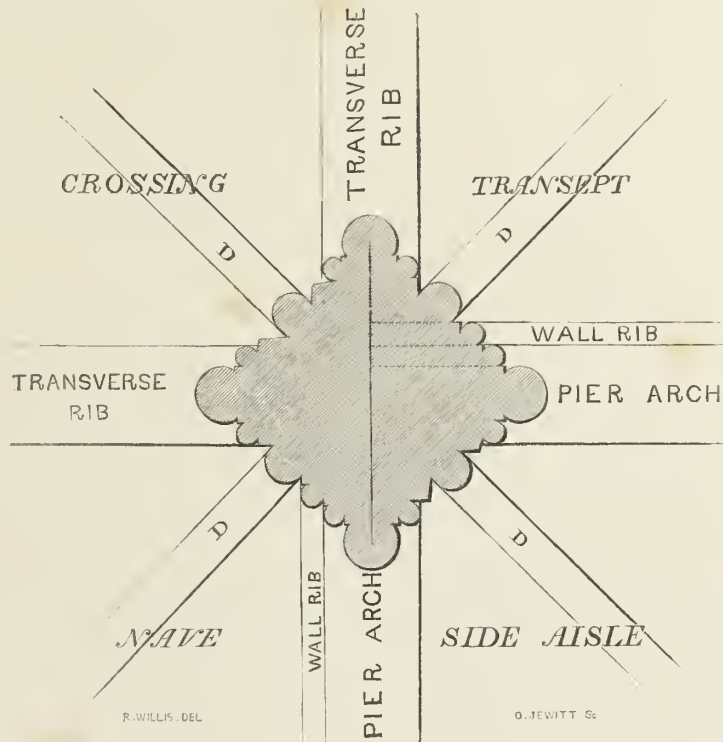


Figure 41

THE first plan represents one of the four great crossing-piers, in which the arrangement of the shafts is shewn with great fidelity. In fig. 41 I have given

*Pilers toraus*; vide Glossarial Index at the end of this volume.

the plan of this pier, with the addition of lines shewing the relation of the shafts to the arches and ribs above. It is a compound pier of a very complex kind, and requires examination to explain its manifest asymmetry. In the earlier mediæval styles the adjustment of the parts of a compound pier to those of the superstructure was very closely maintained, every shaft having its corresponding rib or arch above. A crossing pier, by its position, has pier-arches springing from two of its adjacent angles, and the transverse ribs of the lofty central vaults from the other two adjacent angles.

In Rheims Cathedral the transverse arches of the central vaults are of the same mold as the pier-arches, and, like them, are of two orders<sup>f</sup>. Each of the four angles of the pier is therefore provided with a sub-shaft between a pair of edge-shafts to carry the two pier-arches and two transverse ribs<sup>g</sup>, as the plan shews. The diagonal ribs (D) that descend from each of the vaults are received each upon a shaft placed between the groups already described. But, in addition to these, it must be observed that the clerestory walls which rise above the pier-arches, and against which the central vaults abut, have wall-ribs to receive those vaults, and these wall-ribs rest on a shaft which rises from the ground, together with those already described. Thus it happens that each of the two faces of the compound pier which receive the clerestory walls have four intermediate shafts, while those which receive the high vault of the crossing and the low vault of the side-aisle respectively, have only three intermediate shafts.

Hence the unsymmetrical form of the pier, which has been exactly delineated by Honecort. The three marks on the vertical mid-line of his pier are apparently intended as a guide in drawing the pier edges, as shewn in my diagram; three similar ones are placed on his horizontal line opposite the left-hand lower group. His diagonal shafts are drawn larger than in reality, but in the diagram I have followed his proportions<sup>h</sup>.

The detailed drawings of M. Viollet-le-Duc and Gailhabaud, compared with

<sup>f</sup> The section of these arches is correctly given by Honecort in this plate, and is the second figure in the second row of the moldings; the third figure is the diagonal rib.

<sup>g</sup> Vide my "Remarks on the Architecture of the Middle Ages," 1835, pp. 86, et seq.

<sup>h</sup> Honecort's plan of the great crossing-pier is said by M. Lassus to vary from the real ones only in one point, which is, that those faces of the pier that are garnished with four intermediate shafts are placed opposite to each other in the drawing, and are adjacent in the existing piers. But this must be an

oversight, for the small plan engraved by Gailhabaud, and his partial plan of the transept, concur in giving the four intermediate shafts to the opposite faces, in the same way as in Honecort's drawing, and the analysis which I have given is sufficient to shew that if a fourth shaft be employed to carry the wall-ribs, it will naturally produce the arrangement in question. In the nave the wall-rib shafts spring from the abacus of the pier, and not from its base, as in the crossing-piers, and therefore do not enter into its plan.—(W.)



Honcourt's, shew that his plans of the other three piers are by no means minutely exact. The second of the first row is a respond of the side-aisle, and is true in the number of shafts, but the lesser shafts are much too small in comparison with the larger. The plan omits the upper base-molding E (fig. 32, p. 212), probably because it is merely concentric with the shafts, but inserts two parallel zigzag lines, which are the plans of the plinths D and B, and represent the course of the intermediate molding, C. In reality, the plan-line of the upper plinth, D, is the only correct one, for the molding C and the plinth below it do not mitre round the plinth of the wall-shaft, but run parallel to the wall, so as to form a stylobate for the two wall-shafts that bound the severey on each side, as the lower plinth A is correctly shewn to do by the outer line in Honcourt's drawing.

The first plan in the second row is a pier of the nave, in which the attached shafts are drawn too large, and the plinths in the intermediate portions are curvilinear, and concentric with the body of the pier, instead of running straight in a diagonal direction from one shaft to the next, as in the reality.

The next plan of the second row is one of the piers that separate the chapels

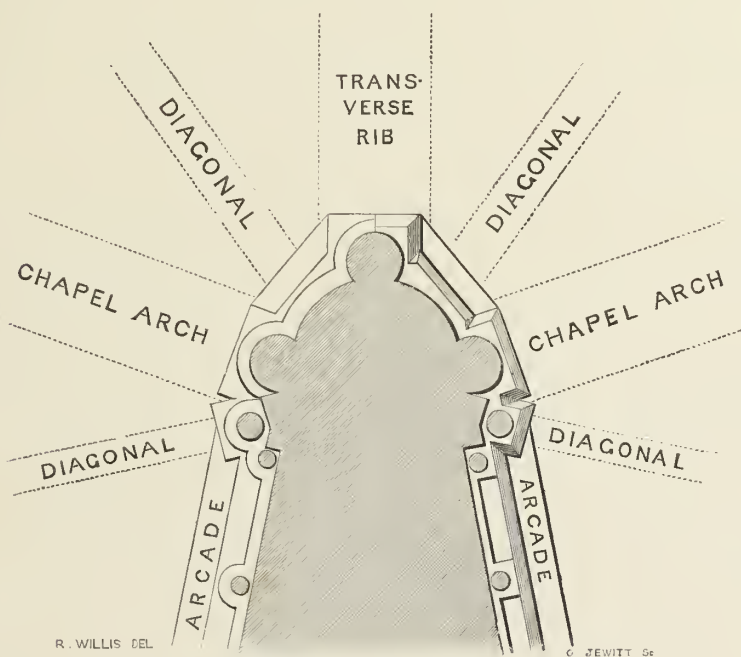


Figure 42.

from each other. It differs essentially from the real piers, as will be seen by comparing it with the above plan of one of them.

Seen from the side-aisle of the real edifice, as in M. Viollet-le-Duc's sketch (p. 205), the front of the pier is exactly like the nave-piers, shewing a large cylindrical body and three appended shafts. But Honecort has formed the front of his pier of a group of five shafts, the difference consisting in the substitution of two intermediate shafts in square-edged nooks for the cylindrical body of the actual pier. All this portion of the pier belongs to the vaulting of the side-aisles. The front shaft carries the transverse rib, the lateral shafts in Wilars' drawing, like the cylindrical body in the real building, carry the diagonal ribs, and the next pair of shafts the arches of communication between the aisle and chapels<sup>b</sup>. Within the chapels there are two other shafts on each side the pier, which belong to the diagonal rib of the chapel vault and to its wall arcade respectively, and are correctly shewn by the artist.

The most curious part of this affair is, that the separating piers of the chapels, as shewn in the modern plan of Cambrai Cathedral (p. 90, above), agree with Honecort's plan, and therefore not with those of Rheims. He may have purposely made this change in the arrangement of the pier, or he may have fallen into a mistake by trusting to slight memoranda when finishing his drawings<sup>i</sup>, but the reproduction of this remarkable variation, in the actual Cathedral of Cambrai, greatly strengthens the conjecture that Honecort's drawings of Rheims were employed in the works of the former edifice.

The system employed for the chapel piers at Rheims is not common. It is to be seen at Beauvais (1240-50) and at Westminster Abbey with some differences. But the system which Honecort has substituted is the ordinary one, and may be found in early examples, as at Noyon, Vezelay, and Bayeux, all early French buildings of the beginning of the century, and is also employed at Amiens and Cologne, and in many other cases. It was familiar to him, and this is probably another instance of his habit of trusting to memory for the completion of his drawings rather than to the object before him.

The lines which represent the bonds of all these piers may or may not be correct. Honecort's expression that they are—"teles com cles *doivent estre*"—as they *must* be—is a confession that he guessed at them from the joints, and implies that he did not see the working drawings. The French commentators truly state,

<sup>b</sup> Marked CHAPEL-ARCH in fig. 42.

<sup>i</sup> It will be seen that the plans of the plinths are as nearly as possible alike in Honecort's drawing and in the real building. To avoid confusion of lines in fig. 42, the complete plan of the plinths is drawn upon the right-hand half, and the plan of the upper

base-mold with only the lower plinth and sub-plinth upon the left-hand half; the word ARCADE is inadvertently written upon the sub-plinth that runs in front of the arches, instead of being placed between the arcade-shafts, as it ought to have been.—(W.)

that as this part of the structure could only be observed in the course of repairs or demolition, they have no means of verifying them. Lassus, however, informs us that the joints of the real piers of the earlier portion of the nave are placed in the same position superficially as in Honecort's plan, so as not to be seen on the plain surfaces. The western compartments, which are later in date, are built on a different system. Each course consists of two stones, each of which carries two portions of the neighbouring attached shafts. The joint falls halfway between these, and is therefore visible on the surface of the body. The courses are set with their joints crossing each other in succession at right angles.

Below the piers is placed a series of profiles of the moldings of the church, under which is written the following inscription:—

“Vesci le<sup>s</sup> molle<sup>s</sup> des chapieles de cele paigne la devant. des formes z des verieres. des ogives z des doubleiaus. z des sorvols p' de seure.”

“Voici les patrons des chapelles de la page là-devant, des fenêtres, des meneaux, des ogives, des arcs doubleaux et des formerets par-dessus.”

“Here are the molds of the chapels of the former page, of the tracery and of the window lights, of the diagonal ribs, and also of the transverse ribs, and the super-arches above them.”

In this inscription several technical terms occur, which must be examined. In Plate 19, Honecort has described his drawing of the tracery of the side-aisle windows as “une des formes de Rains<sup>k</sup>.” The same word is used in English mediæval documents for tracery, and also in French. M. Lassus follows the same interpretation, but translates *verieres* by *meneaux*. Judging by English mediæval documents, I should rather translate this word by *lights*, which is applied solely to the large principal openings between the monials, and in this case would refer to the jamb-molds and monial-molds.

Philibert de Lorme has recorded that the *ogives* are the diagonal ribs of a vault which, as they cross each other in each vaulting compartment, are also termed *la croisée d'ogives*. Also, “There are other arches called *doubleaux*, which separate the vaults<sup>l</sup>, and are thicker than the others.” These are the transverse ribs. In Rheims Cathedral they are unusually prominent, being formed throughout of two orders of voussoirs like the pier-arches. This is very rarely the case in France, especially so late as the thirteenth century, and never, as far as I know, in England.

Now the term *SORVOLS* is derived from *SOR*, *super*, and *VOLS*<sup>m</sup>, or *VOLSURE*, an

<sup>k</sup> Architectural Nomenclature, pp. 48 and 50; Parker's Glossary, art. FORM-PIECES.

<sup>l</sup> *Architecture de Philibert de l'Orme*, p. 107. 1568.

<sup>m</sup> *VOLS* is evidently a form of *volsure*. Thus in the inscription at the foot of the page, we find *volses* for vaulted. In mediæval documents *vault* is often

arch or vault. In this case it must refer to the *super-arch*, or order of voussoirs which covers the *arc doubleau*. In the second figure of the second row we accordingly find an exact section of the transverse rib, and of the super-arch in combination with it, which also represents the section of the pier-arch. This figure may fairly be supposed to be the one described as “les molles des *doubliaus* et des *sorvol*s par de seure.” The mold of the *ogive* stands next to it.

The moldings in these figures are not those of the chapel alone, for the very first compartment on the left hand is the plan of one of the windows of the side-aisles taken across the middle of the monials, or rather a plan of the jamb-molds and of the monial, for the jambs are placed too close together in proportion to the scale of the sections to form a connected plan.

Every one of the sections in this table is distinguished by a peculiar mason's mark, exactly similar to those which are found on the stones of mediæval buildings. That these are in the present case employed as letters of reference is evident by comparing them with Plates 59 and 61, where the same characters occur, and in most instances coincide with the places assigned to the sections by comparing them with the real building. Thus in the exterior elevation of the side-aisle, Plate 61, the monial has a mark corresponding to that on the section we have just described, and the mark on the section of the right jamb is placed on the left jamb of the elevation. It is carelessly engraved in the latter, but in my own tracing is exactly the same as that of the section.

The second compartment contains five separate sections, which belong to the windows of the chapel, and require a separate examination. The first figure represents one of the cusps of the hoop, A, (vide fig. 37, p. 221). These large cusps in the early specimens of tracery were always constructed of separate stones of this form inserted in a groove formed in the circumscribing hoop. The remaining sections are drawn on a larger scale in fig. 43 in their real proportions, and are marked with letters of reference corresponding to those in fig. 37, to shew to which compartments they belong.

A-B is a section taken from the compartment A to the compartment B, and accordingly, the groove for the reception of the cusp-piece appears on the left hand, and the rebate for the glass on the right.

C-B is taken from the compartment C to the compartment B, apparently to

used for an *arch*. M. Lassus has translated *sorvol* by *formeret*, or wall-rib. But he has made no attempt to shew any connection between the term and his application. *Arc doubleau* is, literally, a doubling or lining

arch, and the epithet exactly represents its function, of lining or strengthening the vault or arch under which it stands. When placed under another arch, it would be translated *sub-arch*.

shew the different arrangement of the interior profiles, for the left-hand side has a fillet next to the glass rebate, and a chamfer between that and the roll-molding. But on the right-hand side the fillet is omitted; in this respect it agrees with A-B.

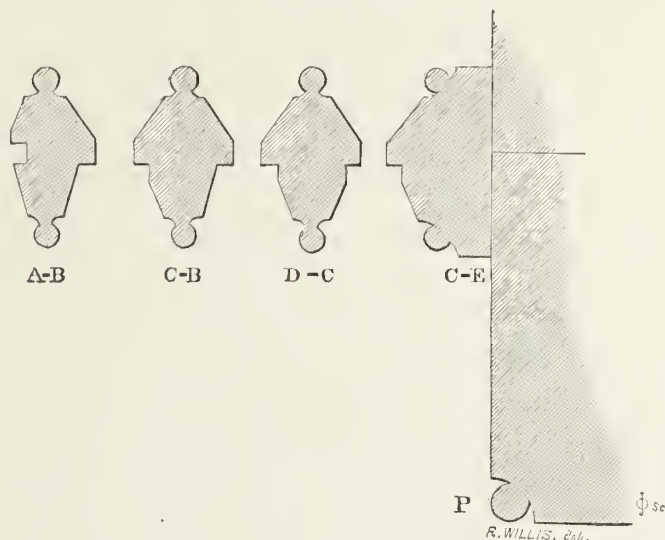


Figure 43.

D-C is taken from D to C, immediately above the capital of the monial-shaft. Both sides of this section are therefore alike, they have the fillet, and are the same as the left half of C-B.

C-E is the plan of the outer arch-mold, and E P is the soffit of the inner vault of the window above the gangways.

The above sections are corrected from my own tracings of the original manuscript, in which the difference between the profiles of C and B are more distinctly shewn than in the engraving. It is not unusual to give a simpler profile to the smaller openings of tracery (such as B and the other triangular spaces above and below the hoop) than to the principal compartments A, D, and C. But I am ignorant whether or no such difference exists in the moldings of the real window. It appears to me to account completely for the three sections A-B, C-B, and D-C, for otherwise the second section would be unnecessary<sup>n</sup>.

<sup>n</sup> The marks upon these sections correspond very nearly with those upon the external elevation of the side-aisle window in Plate 61, although it represents a different window. The double cross of the first section will be found between the hoop and the triangular compartment B. The single cross upon the second section is written between the compartments C and B, in accordance with my explanation,

but is also written above the capital of the monial, as if the section there were the same. On the other hand, the mark applied to the third section, which I have placed in the latter position, coincides with that which is given to the monial of the elevation, of which monial with the same mark a different section has already been given in the first compartment. These discrepancies can be explained by supposing that the

The third compartment of the upper line has a section which, Lassus tells us, belongs to a gallery in the transept, and that the fourth and last is the *formeret*, or wall-rib, of the side-aisle vaults, and the first of the second row the string-course beneath the windows of the side-aisles of the nave<sup>o</sup>.

The second figure of this row, as already explained, is the transverse rib (or *arc doubleau*) of the whole of the vaults, and also the mold of the pier-arches, and agrees exactly with Gailhabaud's detailed sections. The third figure is a correct section of the diagonal vault-rib (or *croisèe d'ogive*<sup>p</sup>). The fourth figure is a plan of the front of the pier which separates the chapel windows from each other<sup>q</sup>. The front shaft carries the vault-ribs, and the lateral shafts the wall-ribs, of which one is shewn at P, fig. 43, above. This plan is drawn looking *upwards*, and thus shewing the peculiar angular position and foliage-knobs of the capital of the shaft. The last figure may be intended for a plan of the same pier, looking *downwards* and shewing the plinths. The two lateral ones rest on the gangway which, as already described (p. 211 above), is carried under the window and behind the piers in question, which are thereby isolated, as in the drawing. The plinth of the front shaft is on the pavement below. The mark upon this section is placed in Plate 59 upon this plinth.—(W.)

sections we are considering really apply to a lost elevation of the chapel windows.

Lastly, the mark on the fourth section, which represents the jamb-arch mold of the window-head, is to be found on the left-hand side of the drawing, as well as the mutilated cross which designates the outer rank of its voussoirs. Yet this in the section is applied to the inner, or escoinson-arch, and in the elevation to the hood-mold, the section of which would be quite different. This also shews that the marks on the sections apply to another elevation.

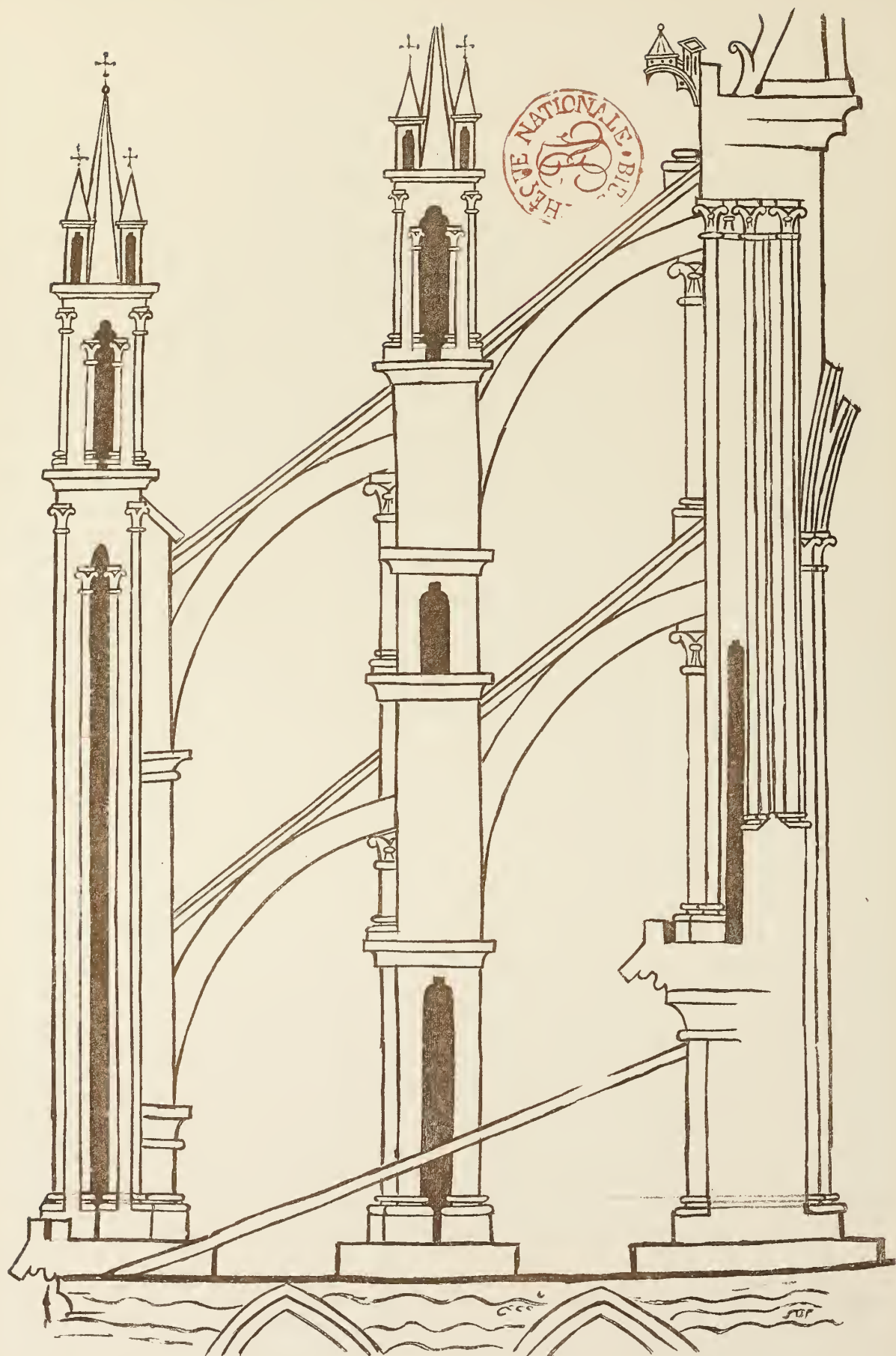
<sup>o</sup> The first of these three sections has a mark very nearly the same as that upon the single shaft of the arcade in Plate 59, but reversed; those of the other two cannot be traced upon the other drawings.

<sup>p</sup> The section of the transverse rib-mold has two

mason's marks separated by a vertical stroke, which cannot be intended for a joint. They probably apply to its double function of a vault-rib and pier-arch mold. The cross on the left hand is marked on the front of the unfinished springing of the vault-ribs in the interior elevation in Plate 61. A small line drawn above it, which indicates a joint or breaking off of the masonry, makes it resemble the character which is applied to the diagonal section. The right-hand mark probably refers to a lost drawing.

<sup>q</sup> Its mark is placed in Plate 59 upon the front shaft, just above the basement, but the section cannot have been taken at this level, because it represents a pier detached at the sides, as this really is, above the stringcourse.—(W.)







## PLATE LXIII.

## VERSO OF THE THIRTY-SECOND LEAF.

THIS page gives the section of the apsidal wall of the Cathedral of Rheims above the level of the chapels, with a lateral view of the double flying-buttresses, and of the great isolated piers which receive them. Although Wilars de Honecort has not led us to expect minute accuracy in his drawings, we are obliged to confess that there are great discrepancies between the details which are given in this page and the reality. This is especially the case with the outer pinnacle shaft. In the drawing this is furnished with an appended buttress facing inwards towards the church. The purpose of this is to receive the imposts of the two flying-buttresses, each of which springs from a molding. The shaft of the pinnacle is in two stories, but the flying-buttresses both abut against the lower one, which is very lofty. In the real building the shaft is also in two stories, but the two flying-buttresses abut one upon each. The lower story has on each face a blank arch<sup>r</sup>, and the upper one a square tabernacle, in which is the figure of an angel. It is this upper story which in the drawing erroneously stands clear above the upper flying-buttress, and is surmounted by an octagon spire with a little square shaft and spirelet at each angle. The real upper story is capped by an octagon spire, with square angle spirelets, but they, having no shafts beneath, rise from the same level as the central octagon.

The great intermediate pinnacle-shaft has none of the stringmolds and arches which are exhibited in the drawing, and its upper termination consists of a plain, heavy quadrangular spire, which is probably due to the restorations that were made after the burning of the roof in 1481.

Wilars de Honecort has carefully traced the battlemented parapet which borders the gutters of the chapels, of the great roof and of the gangway under the clerestory windows, but in his section has omitted the triforium gallery<sup>s</sup>.

<sup>r</sup> This blank arch is indicated in Honecort's drawing, but being filled up with black resembles the pierced openings, which are in this way designated in other parts of these drawings. The lower story of the pinnacle-shaft is greatly too lofty, the upper one and the spire as much too short.

<sup>s</sup> The space for it is left blank in his drawing. The

molding beneath the gangway of the window-sills is shewn, with its return mitring round the base of the pilaster buttress, and from the unfinished air of this part of the sketch, it may be conjectured that in inking his lead-lines he omitted those of the gallery, which had been accidentally rubbed out.—(W.)

The upper termination of the clerestory wall was entirely changed after the fire of 1481; therefore the representation of the tabernacle which originally covered the angels shewn in Plate 61, is valuable, but we find no trace of the gurgoyles (or *nokers*) which now exist, sustained by the cariatides which have been substituted for the angels. Lastly, the crockets shewn at the angles of the great roof inform us that such ornaments ought to be attached to the rolls that separate the lead plates of the roof. We have already seen that a similar ornament must have existed at the angles of the chapels roofs, which were not lean-to roofs, like those shewn in this section, but pyramidal, as in Plate 60.

This page, the last but one of the manuscript, bears, like the first, the red stamp of the Bibliothèque Nationale.—(L.)

Thus far M. Lassus, whose excellent article upon this plate I have given entire. The lean-to roof of the side-aisles appears to me to shew that this section is taken across the narrow severey of the choir which is adjacent to the apse, looking eastward, and not across the apsidal wall. Notwithstanding its numerous errors, it is extremely interesting, as shewing how early the idea of representing the arrangement of a building by a section arose. It is, in fact, the earliest section that has been discovered.

This is the only drawing of the five which belong to Rheims that I am disposed to consider as a copy from a working drawing, and not from the reality. The objects delineated in the previous pages were in existence at the time of Honecort's visit, as, for example, the chapels, and the piers and moldings of which he gives plans and details, as well as the severeys of the choir and nave, which were certainly carried up halfway, and the former, as I believe, even to the roof.

But the discrepancies between this sketch and the reality are so great, that we may well admit that the pinnacles and buttresses were inserted, partly from the stumps and indications exhibited by the toothings of the building, and partly from descriptions or drawings which he obtained on the spot.—(W.)



ppon

Reteneis ce que io u' d'uai. prendes fuelles de col roges.  
 z sanemonde cest une erbe con clamme galio filare  
 prendes une erbe con clamme tanelie z caneuuze  
 cest semence decamure. estampes ces. iij. erbes si  
 quil mar ment pl' de lune. q' de laurre. apres  
 si prendes Sarance. ii. cans q' de lune des. iiii.  
 erbes. z puis si lestampes puis si meters ces. v.  
 erbes en .i. por z si meters blanc um al destenprex  
 le meilleur q' u' poel auoir auqs renprement q' les  
 puronz ne soient trop espellez sicc les purst bonre.  
 uen beuez mie trop enune escargne duet en aues  
 u' asez por q'le soit plainne. quel plare q' u' aies u'  
 en garies. tergies uo plare dun por destourpes  
 metel sof une fuelle de col roge. puis si beuez  
 des puronz al matin z al uespre. ii. fois le ior.  
 eles ualent miez destenprees de moust douc  
 q' dautre. Sin. mais q' soit bon si paerra li  
 moust auec les erbes. z se u' les destenpres de  
 ues Sin laillies les. ii. iors ancois co en botue.

**¶** Cuellies uos floz aumati de diuerses coloz ke  
 June ne touce alaure. prendes une maniere de  
 pierre co taule actiel. q' le soit blanche moire z delie.  
 puis si meters uos floz en ceste purre. cascade  
 maniere pl' si duerront uos floz en loz coloz.

## PLATE LXIV.

RECTO OF THE THIRTY-THIRD LEAF, MARKED IN THE FIFTEENTH CENTURY WITH THE NUMERAL XXVII.

THE numeral proves that seven leaves between this and the preceding have been abstracted since the fifteenth century. But as in the rest of the Album every sheet of parchment is folded into two leaves forming four pages, we may conclude that, prior to this paging by J. Mancel, one of the original pages had been removed. The reverse side of the thirty-third leaf is blank, and therefore this engraving completes the facsimile of the manuscript.

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“Retencis co que io vus dirai. Prendez fuelles de col roges. et sanemonde [cest une erbe con clainme galion filate] prendes une erbe con clainme tanesie et cancuize [cest semence de canvre]. Estanpes ces .iiii. erbes si quil ni ait nient plus de lune que de lautre. Apres si prendeis warance .ij. tans que de lune des. iiii. erbes. et puis si lestanpes puis si meteis ces .v. erbes en .i. pot et si meteis blanc vin al destenprer, le meilleur que vus poes avoir, auques tenprement que les puizons ne soient trop espessez si con les puist boire. Nen beveiz mie trop; en une escargne duef en arez vus asciz, por quele soit plainne. Quel plaie que vus aies vus en garires. Tergies vo plaie dun poi destoupes. metes sus une fuelle de col roge. puis si beveis des puizons al matin et al vespre .ii. fois le ior. Eles valent miex destemprees de moust douc que dautre vin. Mais quil soit bons; si paerra li mous avec les erbes. et se vus les destenpres de vies vin laissies les .ii. iors ancois con en boive.

“Cuellies vos flors au matin de diverses colors ke lune ne touce a lautre. prendes une maniere de pierre con taille a ciziel. quele soit blanche molue et deliie. Puis si meteis vos flors en ceste poure. Cascune maniere par li. si duerront vos flors en lor colors.”

“Retenez ce que je vous dirai. Prenez des feuilles de chou rouge et de la sanemonde (c'est une herbe qu'on appelle chanvre bâtard). Prenez une herbe qu'on appelle tanésie et du chènevis (c'est la semence du chanvre). Écrasez ces quatre herbes, de sorte qu'il n'y en ait pas plus de l'une que de l'autre. Ensuite vous prendrez de la garance deux fois autant que de l'une des quatre herbes et l'écraserez. Puis vous mettrez ces cinq herbes en un pot et les ferez infuser dans du vin blanc, le meilleur que vous puissiez avoir, avec cette précaution que la potion ne soit point trop épaisse et qu'on la puisse boire. N'en buvez pas trop; dans une coquille d'œuf vous en aurez assez, pourvu qu'elle soit pleine. Quelle plaie que vous ayez, vous en guérirez. Essayez vos

plaies d'un peu d'étoupe, mettez dessus une feuille de chou rouge et buvez de la potion matin et soir, deux fois le jour. Elle vaut mieux infusée dans du moût doux que dans d'autre vin, pourvu qu'il soit bon. Le moût fermentera avec les herbes. Si vous faites infuser dans du vin vieux, laissez deux jours avant que d'en boire.

“Cueillez vos fleurs au matin de diverses couleurs: que l'une ne touche point à l'autre. Prenez une espèce de pierre que l'on taille au ciseau et qu'elle soit blanche, moulue et fine, puis mettez vos fleurs en cette poudre, chacune suivant son espèce. Par ce moyen se conserveront vos fleurs avec leurs couleurs.”

“Remember well what I have to tell you. Take the leaves of red colewort and of avens. Take also an herb called tansy and some hempseed. Crush these four herbs together in equal quantities. Take of madder twice as much as of each of the others, and crush it. Then put these five herbs in a pot, infusing them in white wine, the best you can procure, and taking care that the mixture is not too thick to drink. Do not drink too much at a time, an eggshell will contain enough for a dose, provided it be full. It will cure any wound that you may have. Clean your wound with a little tow, put upon it a leaf of the red colewort, and drink the potion morning and night, twice a-day. It is best prepared with new sweet wine, if it be of good quality. It will ferment with the herbs. If your infusion be made with old wine, leave it two days before you drink it.

“Gather flowers of different colours in the morning, and do not let them touch each other. Take a sort of stone which can be cut with a chisel, and see that it be white, and reduced to a fine powder. Lay your flowers in this powder, each according to their species. In this way the flowers will preserve their colours.”

The use of the first of these receipts may have been familiarized to De Honecort by the bruises which all workmen are liable to in their workshops. The second seems the same as that given in the following verses of the poem *De Artibus Romanorum*, by Heraclius, who lived about the tenth century:—

“Flores in varios qui vult mutare colores,
Causa scribendi quos libri pagina poscit,
Est opus ut segetes in summo mane pererret
Et tunc diversos flores ortuque recentes
Inveniat, properetque sibi decerpere eosdem.
Cumque domi fuerint caveat ne ponat in unum
Illos, sed faciat quod talis res sibi poscit vel quærit.
Dum super æqualem petram contriveris istos
Flores, incoctum pariter congere gypsum.
Sic tibi siccatos poteris servare colores.”

These verses teach us to gather the flowers in the morning, to keep them asunder, and to cover them with unbaked gypsum after having bruised them on a stone. But Heraclius gives this as a method of obtaining vegetable colours, while Honecort appears to intend the preservation of the flowers.—(A. D.)

ADDENDA ET CORRIGENDA.

- PAGE 8. The church of St. Yved de Braine has lately been made the subject of a complete monograph, by M. Stanislas Prioux, published at Paris in folio, with twenty-seven plates of architecture and monuments.
- Page 13, line 3. As thirty-three leaves remain in the manuscript, and therefore sixty-six pages, there is an apparent discrepancy in the statement that only sixty-three plates are devoted to the drawings. It should have been mentioned that the recto of the third leaf and the verso of the last leaf are blank, and that the recto of the thirty-third leaf is wholly occupied by recipes.
- P. 17, l. 21. *For* Cosmos, *read* Cosmas.
- P. 20, l. 7. *For* To trace the joints of voussoirs, *read* How to cut a voussoir according to rule, Pl. 38, No. 18, 19.
- P. 23, l. 1. *Agies* (of the Twelve Apostles in Plate 2). M. P. Merimée gives the following remarks in the *Moniteur Universel*, Dec. 20, 1858:—"M. Littré has communicated to me several passages, unfortunately none of them anterior to the fifteenth century, in which *agiaux* or *agios* has the sense of dress or ornaments. Ménage remarks that at Paris they speak of *les agios* of the village bride, that is to say, her *parure*. Trévoux in his Dictionary gives the same phrase and the same interpretation. Honcort's legend must therefore be translated "the costume" (or, in the language of the studio, the *ajustement*) "of the Twelve Apostles."
- P. 49. In the *Dictionnaire d'Architecture* of M. Viollet-le-Duc, t. iv. p. 441, is a description of this cross, with a drawing shewing that author's conception of its true proportions. He is of opinion that it must have been cast in bronze, and that the shaft of the column was loftier and more slender than in Honcort's sketch.
- P. 57 and 58, note j. Vide *Col* and *Forkies* (*pillers*) in the Glossarial Index.
- P. 80. A pair of wrestlers differing in some respects from these examples is in the Luttrell Psalter. (*Vetusta Monumenta*, vol. vi. pl. 24, fig. 4.)
- P. 93. *For* No. 1. and No. 2. beneath the woodcuts, *read* Fig. 5. and Fig. 6.
- P. 140, l. 8. The *quarto acuto* of Viola is rounded at the apex, so that it is not in reality a pointed arch, although the mode of its description is based upon the mediæval nomenclature and methods.
- P. 161. The angel above the apse of Rheims Cathedral also turns upon a pivot, according to M. Gilbert, and was therefore probably the subject of Honcort's description in this place.
- P. 162. The engine here described may be one of those to which the name *ferne* or *verne* is applied in mediæval documents. For example, *Le ferne* occurs in the Ely Fabric Rolls, 16 Edw. II.; "ij. gynnes voc' *fernes*," in a Roll of works at Westminster, t. Edw. I., and *verne* in another similar roll, 2 Edw. III.; "grece for the *veryn*," &c., Churchwardens' Accounts, Walden, Essex, 6 Edw. IV.; "*Ferne* and *Feryn*," in the Fabric Rolls of York Minster, just admirably published by the Surtees Society, under the able superintendence of the Rev. J. Raine, jun. In all these cases, as well as in others, there are accompanying details which shew the thing so named to have been a mason's or carpenter's machine for raising heavy materials. On the

other hand, a windlass in Lincolnshire is still called a *fearn*, (Halliwell's "Archaic Dictionary"); and *verin*, in the glossaries of French practical writers of the last century, is the name of a kind of screw-jack for raising and supporting loads. (Vide Daviler, Felibien, and the *Dictionnaire de Marine*, Amst. 1702.) Lastly, Cotgrave gives,—"*Chevre*, the engine called by architects, &c., a *fearne*;" and the French *chevre* is the English "triangle, or three legs," which has a windlass attached it whose rope acts upon the load by means of a pulley at the apex of the triangle.

- P. 196, note b. *Windas*. In his glossary the French editor quotes, as his authority for interpreting this word as a spring, the following passage from the Statutes of the "Serruriers" of Abbeville, A.D. 1480:—"Nuls ne porra faire *windas*, eri, poullietz, et aultres engins a bender arbalestres. . . . Item que les dits *windas* soient bien et souffisanment fais sans brasures sinon es lieux a ce convenables et necessaires." This passage, which may be translated, "No one shall make windlasses, levers, pulleys, or other machines to bend cross-bows," appears to relate wholly to the well-known contrivances necessary to enable the archer to bend the steel bow, which was too powerful to be overcome without mechanical assistance. It cannot be so rendered as to make *windas* signify a *spring*. In fact, Grose, amongst other writers, enumerates in his "Ancient Armour," (p. 59, and note x,) the devices supplied for bending cross-bows as above. The *windasse*, or *windelaïse*, was also called *moulinet*; and the lever, a *bender*, *goal's-foot*, (or *piéd de biche*). Roquefort gives "*Croc de fer . . . instrument pour bander une arbalete*;" and the *eri* of the passage above is probably another name of the same lever.—(W.)
- P. 227, l. 1. *Toral*, *piler toral*, or *pilers torausz*, applied to the great crossing-piers of Rheims; probably tower-piers, from "Tor, a tower, (Roquefort)." M. Quicherat refers to *Arcus toralis* in Ducange, where the phrase in the acts of a Spanish council in 1582 is applied to the arch of separation between the nave and choir, or perhaps to the arched doorway in the choir-screen, for the Benedictine editors render the phrase in question, "Cancelli qui separant sanctuarium vel chorum a navi in basilicis, sic dicti, ut opinor, quod pars januæ superior arcus speciem refert." They suppose *toralis* to be an error for *choralis*. I also find in the *Dictionnaire de Trevoux*, 1771:—"TORAL, or THURAL, f. m. Terme de coutume. Elévation de terre, ordinairement couverte de gazon, que l'on fait entre deux héritages, qui appartiennent à deux différens maîtres pour servir de séparation, *Agger, aggestus toralium*." This sense is also given in Ducange, under *Torale*, No. 2, and justifies the interpretation of *Arcus Toralis* as a boundary. But the Spanish Dictionary of the Academy of Madrid, quoted by Henschel, gives, "*Toral*, adj., *Lo principal o que tiene mas fuerza, y vigor en qualquier especie, como Arco toral, fundamento toral. Viene del Latino. Torus Toralis*." (*Diccionario de la lengua Castellana*. Madrid, 1739.) This would translate our phrase to mean "the great or principal piers."—(W.)

GLOSSARIAL INDEX.

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*The Arabic numerals refer to the pages, a number in brackets, thus (No. 28), to the article upon the page that follows it, and the small letters in brackets, thus (a), to the foot-notes.*

### A.

ACAÏNTE, side-aisle, 105.  
 AGIES, Addenda, and 23.  
 AGUILE, a spire, (No. 28) 144.  
 ARBRE, the axis of a wheel, 166.  
 ARKET, small arch, 57.  
 ARKIERE, a loop-hole, 57. "Trous qu'on faisoit dans les murs d'une forteresse pour tirer des fleches aux ennemis; cu bas Lat. *archesia*, en Prov. *arkieiro*, *archeiro*.—Lucarne pour recevoir du jour par une cour ou un jardin."—(Roquefort.)  
 ARS BOTERES, ARS BUTERET, flying buttresses, 86.

### B.

BEHOT, BEHOS, a tube, 53.—BEH, *lit.*, canal. (Allemand.)—BEDUM, the bed of a river or of a mill-course. (Ducangc.)  
 BESLOGE, skew, or oblique, 126.  
 BEVUM, we bevel, 151.  
 BOSINE, a trumpet, (k) 115.

### C.

CANTEPLEURE, the siphon of a Tantalus cup, 53. *Chan-tepleure*, *robinet*, Fr.: a waste-pipe or channel of a reservoir, to let off the water when it rises above its proper level. (*Dictionnaire d'Aviler*). A cock or tap, to cause water to flow from a vessel at pleasurc.  
 CAPITEL, capital of a column, 147. Roquefort gives, "CAPITELE: Chapitre, lieu où s'assembloient les chanoines et les moines;" and, "ON: où *ubi*; au, *ad*; &c." Therefore ON CAPITEL in this place may be translated 'in a chapter-house.'—(W.)  
 CAVECE, CHAVEC, the chevet or east end of a church, 123, 86.  
 CENTICORE, an imaginary animal, 22.  
 CHAROLE, the circumscribing aisle of an apse, 91. (See CAROL in "Oxford Glossary," 5th ed.)  
 CINTREEL, the centering of an arch, (No. 4) 123.  
 CLEF, the key-stone of an arch, (No. 22) 137, (No. 24) 138.  
 — the capping and elbows of stall-work, 185.

COEN, quoin, or corner, (No. 14) 129, (No. 26) 143.

COL, projection of a buttress, 57, (j) 58. "Item ondit coste entre lesdis pilliers a deux autres pilliers espassez portans chacun iii. piez de *col* et deux piez despoisse."—(Account Roll, 1399, Bull. du comité historique, p. 53. 1849).—(L.)

COMBLE A VIIJ. COSTÈS, an octagon spire, 41.

CONBLE A VIIJ. CRESTES, an octagon spire with a crest of crockets on each angle, 57, (h) 58.

COMPAS, a pair of compasses, (No. 40) 152. Or the arc described by them, as "a iij. *compas*," a trefoil, 45. Also "on canpe a compas," i. e. "champ decrit au compas," Fr., a circular area, 120.

COPRESSE, a shore, 166.

COVERTIC, a sloping roof, 41, 219.

CRESTE, a row of crockets, 57.

CRETIAUS, merlon of a battlement, 217, 218, 219.

### D.

DOUBLIAUS, transverse vault-rib, 231.

### E.

ENBRACEMENT, framing or bracing of a wheel, 166.

ENGIENG, ENGIENS, any mechanical contrivance, 23, 54, 162, 165, 195. (Vide Renouvier, *Des maîtres de pierre de Montpellier*, p. 212.)

ENTAULEMENS, entablature or stringcourse, the *tablement* of our mediæval nomenclature, 57, 217, 219.

ENTRECLOS, partition (i. e. of stall-work), 185.

ERRACENMENS, springing stones of a vault or arch, 124, (No. 38) 150.

ESCAUFAÏLE, calefactorium, or hand-warmer, 54. *Escauffiole*, bassinore de lit. *escauffet*, réchaud de feu, poëlon.—(Lacombe.)

ESCONSE, dark lantern, 106.

ESLIGEMENT, plan, or floor, (g) 57, 86, 94.

ESPASES DE LE NEF, severies of the nave, 63.

ESSCANDELON, a graduated scale, (No. 27) 144.

ESTACES, piles in water, 165. "ESTAC... pieu poteau," &c.—(Roquefort.)

ESTAGE, story, or floor, 41, 205.

ESTANCON, post, or stanchion, 195, 203.  
 ESTAUS, church-stall, 185, 191.

## F.

FERNE, or VERNE (Eng.), an engine for raising materials, Addenda.

FILLOLES, turrets grouped round a tower, (h) 57.

FLEKE, the detent of the trebuchet, 195, (b) 196, 202, (c) 202.

FORKIES (PILERS), angle buttresses arched below, so as to resemble a fork, 57. *Fourke*, en patois picard et rouchi. *Vorkehr*, turned, or set in front, (German.)—(L.)

FORME, frame or tracery of a window, 63, (o) 139, 231.

FUS, FUST, timber, (Roquefort,) 105, 127.

## H.

HENAP, a cup, 53. "Pateras dicuntur cuppas hanaps. (Jehan de Garlande, c. 1220)."—(L.)

## J.

JAGHS, gaged, (No. 38) 150.

JERLOGE, OROLOGE, a clock, 41.

## L.

LEGIÈRE, in the sense of easy to make or do, 105, 191.

LETRIS, a lectern, 45. "*Lectrinum*, *lectricium*, a church desk."—(Ducange.)

LEWIS (Eng.), *Louve* (Fr.), an instrument to grasp stones, 163.

LINEL, LIVEL, a mason's line or level, (No. 14) 129, (No. 31) 146.

LOISONS, bond or joints of masonry, (o) 97, (No. 26) 143, 227.

## M.

MAILLE, a mallet, 35.

MASONS DON OROLOGE, MAISON DUNE JERLOGE, a clock-house, or clock-case, 41.

MOLE, MOLLE, mason's mold or pattern, 121, (No. 29) 144, (No. 37, 38) 150, 231.

MONTÉE, DROITE MONTEE, elevation or view, 57, 205, 217, 219.

MORS, sloping cap of a pilaster or buttress, (a) 220.

## N.

NOKERES, spouts to throw off water from a roof, 219 line 16. "Noc, gouttière, plomb qu'on met en avance sur les toits, pour faire écouler l'eau."—(Roquefort.) Also Tarbé, *Glossaire de Champagne*.

The word *noquet* is now employed in France for the strips of lead or zinc which are laid on the ridges and other parts of roofs. Angl., *flashings*.

## O.

OGIVE, the diagonal rib of a vault, 231.

ORBES ARKES, arches against a blank wall, 211, (q) 211.

## P.

PAELETE (*Petite poêle*, Roquefort), a little brazier, 54.

PEIGNONS, PEIGNONCIAUS, gables, 41.

PEN, PAN, PLAIN PAN, flat walls (or curtain walls) of a church between buttresses, 86, 219, 227. Vide "Oxford Glossary," 5th ed., art. Pane.

PENDANS, the voussoirs of vaulting surfaces or pendentives, 135. (Vide VOSURE PENDANT.)

PENIAUS (*panneaux*, Fr.), panes, or pannels, 41.

PENTAGRAM, the star-shaped pentagon, 113.

PILER, picr of a church, 97, (No. 26) 143, 227.

Pilaster, or buttress, 57, 63. ("Pilar, pilare, *pilier extérieur*," Renouvier, p. 216.)

PLONC, PLOM, plummet, or plumb-rule, (No. 14) 129, (No. 31) 146, (No. 34) 148, 165.

POUPEE, the terminating standard of a range of stalls, 185, 191. From *poupée*, a child's doll, a bundle of hemp, or other commodities. This derivation would suit our "popit-head," better than the application of the word to the terminating standard. It may be derived from *poupe*, Fr., (*puppis*, or *popa*, Ducange,) the poop or stern of a ship. For the standard, usually covered with rich carving and imagery, terminates the range of stalls in the same manner as the elaborately carved stern terminates the hull of a ship.—(W.)

PRAEL (*préau*, Fr.), a cloister-garth, (No. 11) 127.

PRESBITERIUM, BRESBITERIUM, the apse or eastern extremity of a church, 91, 94, 103.

## R.

REONDE VERIERE, a rose-window, 99.

RIEULÉ, according to rule, regular, (k) 132, 135. "Rieule, *règle de maçon*, à Lille. Rienlet, Dict. rouchi-français."—(L.)

## S.

SAINT GRAAL, 33, 75.

SARFENS, dragons, 45.

SCERE, a mason's square, (No. 23) 137.

SOLE, platform, or base-framing, 165, 195.

SOORE, a saw, 159.

SORVOLS, super-arch, the upper order of voussoirs in the transverse ribs of Rheims, 232.

SUEL, a window-sill, 219, line 9.

## T.

TESTES DE FUELLES, foliated heads, 37, 155, 157.

THRC, arch of the third point, (No. 22) 137.

TOR, TOOR, a tower, 57, (No. 28) 144, (No. 32) 146, (No. 35) 149, 166.

TORAUS, (PILERS) the crossing or tower-piers of a church, 227, and Addenda.

TORETE, TOURETE, turret, 53.

TRAVECONS, cross-pieces or legs connecting the siphon tube with the bottom of the Tantalus cup, 53.

## V.

VERGE, the beam of the trebuchet, 105, &c.

VERIERE, VERRERES, VESRIRES, window, or lights of a window, 99, (No. 5) 123, 231.

VOIE, the deambulatory of a cloister, (No. 11) 127; gangway under the windows of the chapels and triforium gallery of Rheims, 211, 219.

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